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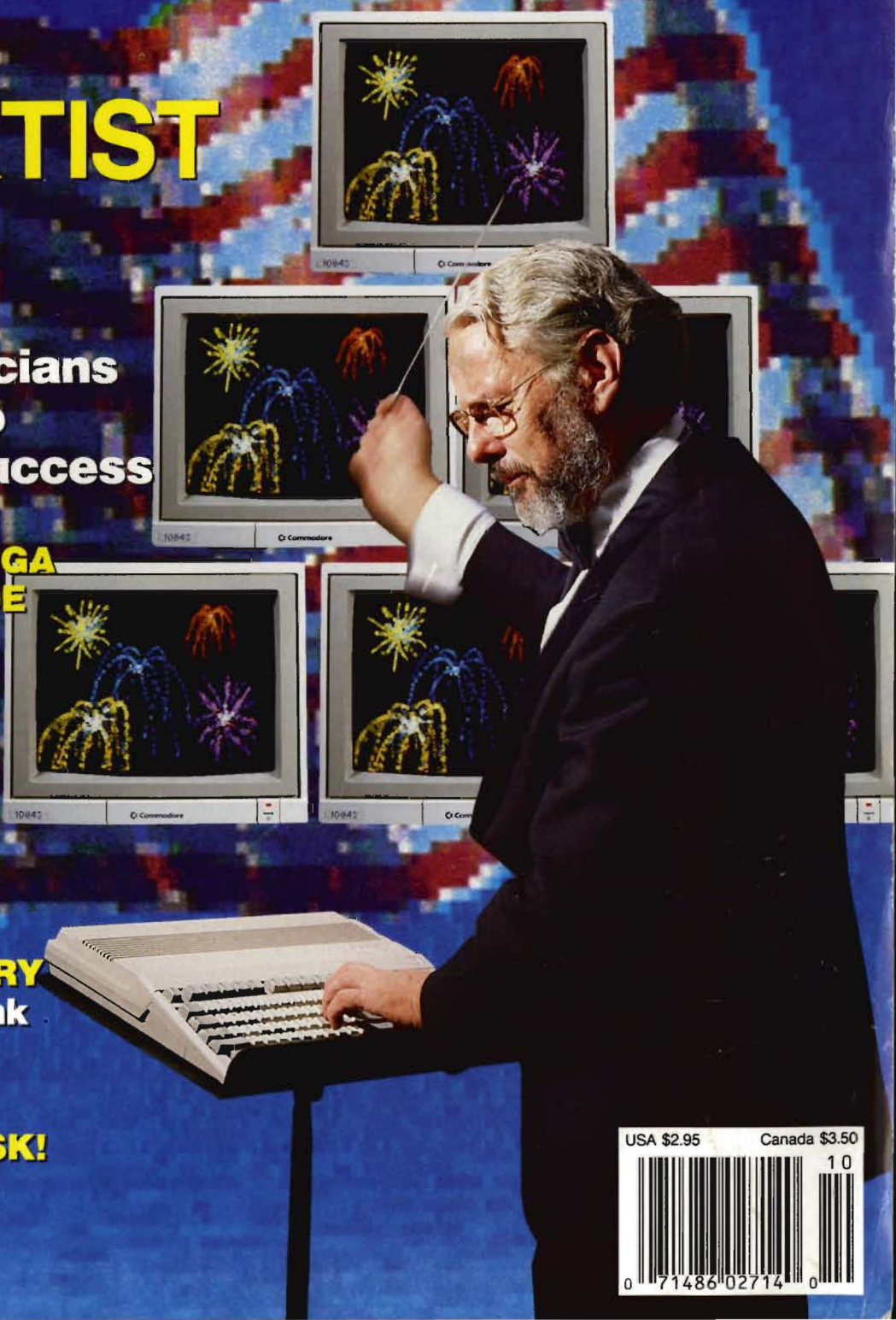

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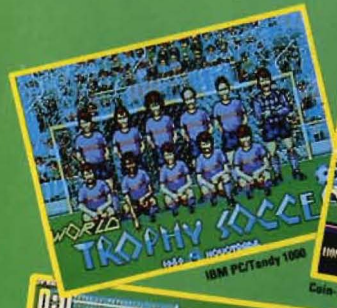

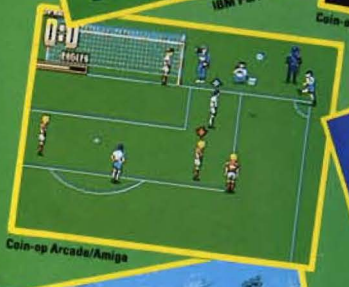

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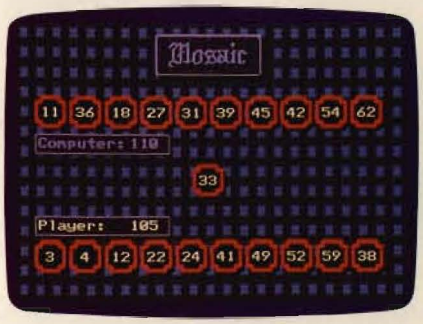

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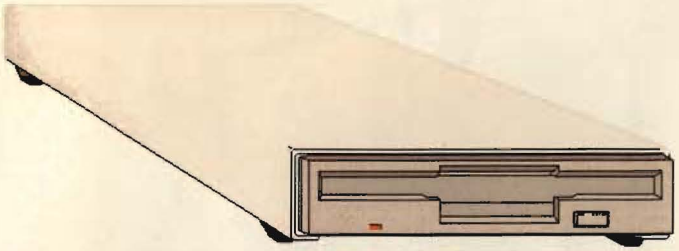

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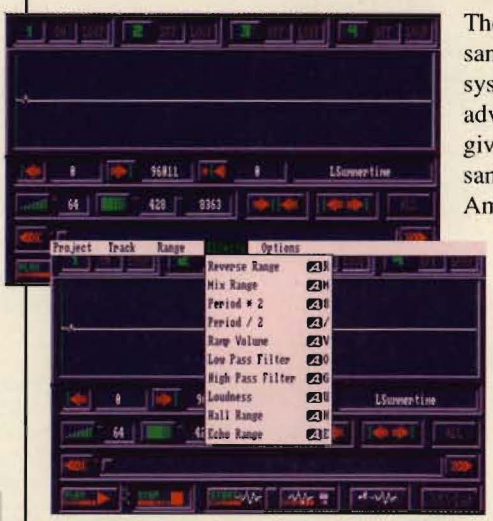

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THE WINDOW

Perspectives from the Editors

Amiga Maniacs.

That's what the rest of the COMPUTE! Publications staff calls us. Here in Greensboro, North Carolina, the people that work in our offices put together four magazines. Two are monthlies—*COMPUTE!* and *COMPUTE!'s Gazette.* Two are bimonthlies—*Amiga Resource* and *COMPUTE!'s PC Magazine.* Down the hall is COMPUTE! Books.

It's hard to say exactly why they call us maniacs. After all, we don't mean to put down other computers. All computer users are brothers and sisters, no matter how powerful our machines or how pathetic theirs. Still, we have this reputation for being vicious.

Poor Denny Atkin, one of COMPUTE!'s newer assistant editors. He was grilled by those wary of the Maniacs when he came in for his interview. He was an Amiga user, and all of them are rabid, right? So, could he write about other machines fairly? Time will tell.

Poor David Florence, COMPUTE! Books Programming Assistant. Always on the Atari ST warpath, he's the last of that diehard breed here. It's hard to blame him, though. David and the Amiga are clearly on different wavelengths. In fact, we try to keep him away from Amigas, which helplessly guru whenever he gets close.

You'd think a bunch of maniacs like us could handle some weirdness, but things got truly bizarre last issue.

First, we caught a virus. Now we all knew that viruses were bad things, but we had no idea of just how bad they were until we caught one. We believe the virus came in on a submission to "Amiga Art Gallery." The virus that caused the trouble was the Lamer Exterminater. This virus writes its name to random sectors every three boots. The first thing it took out was diskcopy. The second was *Tetris.*

Since we were so used to our Amiga 2000 acting flaky (it's on loan from Commodore; we suspect it's an errant prototype), we assumed this symptom was merely a manifestation of its profound psychological and/or hardware problems. I valiantly offered to take the *Resource Disk* home to my healthy, working system to fix it. That's how I caught the virus. Luckily, I had installed the custom bootblock included with DevWare's *Anti-Virus.* When the protection message failed to appear the next time I booted, I knew I was in trouble. An install from a clean Workbench solved the problem. Denny brought in the latest version of *VirusX* (3.2), and we've been blissfully healthy ever since.

Viruses are not dead. In fact, about one in five of the art submissions we receive includes a virus. When we get an infected disk, we clean it and send it back to the author with a letter notifying him or her of the problem, It saddens us that many new Amiga owners who are so excited about their machines are doomed to intermittent crashes and lost art.

The virus experience was weird—but things got weirder. The Commodore legal people sent us a letter notifying us that we were using the name Amiga in our magazine. No kidding. And they'd like us to send them 100 copies of each issue. Sheesh! Maybe we should have launched *COMPUTE!'s MacResource* instead. I'm not sure how it will all work out, but if we have to be this generous, we'd like to welcome 100 new readers to our magazine.

By the way, *Amiga Resource* is now officially a bimonthly publication. You'll notice the October cover date on this issue. The previous issues were labeled Spring, Summer, and Fall, even though we were delivering them at a bimonthly rate. We're happy to be up and running in high gear. (At last!)

—Rhett Anderson

Looking ahead...

The Amiga is making waves in Hollywood, and next issue we have an exclusive interview with Pacific Motion, a Burbank company that's using Commodore's creativity box to land some big accounts (ever heard of *Three Men and a Baby?*).

For you BASIC programmers out there, you can look forward to part 2 of "Amiga BASICs." In it you'll find which BASIC is the most powerful and which is the easiest to use.

Yes, it's true. Our animation buyer's guide which was scheduled for this issue was simply too big to print! So, without sacrificing the contents page or the front cover, we've devised a way to cram it into our very next issue (no, you won't need a magnifying glass to read it). Look for it; if you're interested in animation, it's worth the wait.

What's going on our next disk? This has become a hot topic with our readers ever since they've seen the quality of our games and utilities—so hot that we've been forced to keep it under wraps. So, if you want to see how we top "Advanced Laser Chess" or outdo "Rejection," we'll see you next issue.

READERS FEEDBACK

Send questions or comments to Amiga Feedback, COMPUTE!'s Amiga Resource, *P.O. Box 5406, Greensboro, North Carolina 27403. We regret that, due to the volume of mail received, we cannot respond individually to questions. We reserve the right to edit letters for clarity and length.*

Unfair Review?

I was thoroughly amazed at the review of *Sword of Sodan* in your Summer issue. The article provided no justification for the review ratings that T. T. thought *Sword of Sodan* deserved. This was undoubtedly because the opinions expressed were unjustifiable. I would be inclined to attribute this vague and uniquely critical article to inexperience of the reviewer, but the same reviewer showed competent knowledge of quality when he reviewed *Hybris* in the same issue.

But even in comparing those articles, I found myself confused especially in respect to the graphics ratings. T. T. judiciously gave *Hybris* a graphics rating of 5 and curiously gave *Sword of Sodan* a 2. The same artist did the graphics for both games and personally feels he did a better job on *Sword of Sodan.* Further, how could anyone possibly give *Sword of Sodan* a 2, seeing that *Annals of Rome,* the next game reviewed, also received a 2? Does this mean *Sword of Sodan* and *Annals of Rome* are comparable with respect to graphics? Surely this is pure insanity.

I could go on similarly about the perplexing and unexplained ratings T. T. gave for sound and documentation. Julian LeFay wrote the music for *Sword of Sodan.* Mr. LeFay has also produced several albums in Europe and is there recognized as an exceptional musician. The music for *Sword of Sodan* took as long to write as the program itself. In addition to the music, extreme care was taken in perfecting the multitude of digitized sound effects found in all the levels. The documentation was written by Bob Hires, a highly regarded columnist and published fiction author.

T. T. dedicated two sentences to justify his rating of 2 for the playability of *SOS.* This justification is dubious at best. His one example of the "many petty problems" concerns the barrels, which he says occur during most of the game and which appear "out of nowhere." Barrels are only present in 2 of the 11 levels, and they appear at the far right of the screen and roll toward the left. T. T.'s major objection to the barrels, and therefore presumably to the playability, is that they roll through the enemies. Issues such as memory restrictions aside, it must be remembered that the player is the challenger, and the challenges are designed to work against him or her, not against each other. There is no need for guards to avoid other traps. Of course, realistically speaking, T. T. has a point. But this point seems too trivial to account for the playability rating.

Finally, T. T. not only failed to give an accurate rating of the game, but also neglected to determine the correct retail price of it. *Sword of Sodan* is $49.95, not $39.95 (and is in every respect worth the money).

The readers rely on the reviewers to give an accurate portrayal of products. I fail to see how this is an accurate portrayal and how this article is not a betrayal of the reader's trust. Everyone is entitled to an opinion, but when that opinion strays too far from the norm it is called insanity.

Richard Smith
Customer Service Department
Discovery Software

We wouldn't exactly call T. T. (Troy Tucker, COMPUTE!'s game-happy programming assistant) inexperienced. When it comes to playing arcade action games, he is a true veteran.

It is indeed the responsibility of the editors to ensure that reviews are fair. However, we can't collectively judge every piece of software that comes through our offices—that's up to the reviewer, and everyone has different tastes. In this case, many of us did see Sword of Sodan, *and we agreed with Troy's assessment.*

Review points for games are not

Where to Write

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For your group to be included in our regular listing

absolute—they are based on the type of game reviewed; we expect better graphics from an arcade-style game than we do from a strategy game.

We've asked that Troy elaborate on his review. We'd be glad to hear the opinions of other readers.

T. T. responds:
The purpose of a mini-review is to provide our readers with a short, accurate description of Amiga software. Each reviewer is given up to 200 words to describe the most significant points, if any, for each software product. Because of the small amount of space, the reviewer cannot describe every point in detail.

I feel that the rating I gave for the music and sound effects was a generous one. My ratings were not based on who designed the music or how long it took to perfect the sound effects. In my opinion, the music was good and the sound effects were generally bad.

I rated the documentation a 3. It scored that high because of the quality of the paper and the fancy script used in writing the fold-out storybook. The story itself was hard to understand and didn't help with the gameplay. The real documentation consisted of about one paragraph stating that you must kill the enemy with your sword and pick up potion bottles along the way.

Finally, I would like to address the "many petty problems" found in Sword of Sodan. *My playability rating was directly affected by the barrels that roll over the enemy characters. My guess is that these arbitrary obstacles were thrown in, late in the development process, because certain levels were too easy to pass.*

A few other problems also appeared that affected the playability rating. For example, I could not get the game to run on two out of three Amiga 1000s here at COMPUTE!. The one that did work would lock up as I entered the castle when I was using an external disk drive. These problems occurred only on the older Amigas.

Occasionally, I could kill one of the axe-wielding characters and he would remain standing with his eyes open. Luckily, I could pass through him and continue the game. Sometimes, at the end of a level, an invisible creature began inflicting damage to my character. I couldn't see anything or hit anything, but I sustained damage when I didn't back up.

Taking Sides on Taking Sides

I enjoyed your "Taking Sides" column, "Disk Copiers—Weapons or Tools," in the Spring issue. However, I hope Mr. Anderson is not trying to call me a pirate because I have some free time and use an "insidious" disk copier. (I buy my software, even the software I intend to give as a gift.)

In the past, I've lost expensive software and have had to replace the entire package. Mr. Thompson spoke of a right of the purchaser to make his or her product last. No, Mr. Anderson, you won't find this right hidden in the Constitution; it's merely the right we all have to protect ourselves against accidental loss or damage. We've all heard of insurance. Isn't that what this is? I'm paying the copier people to help protect me against future loss so that I won't have to buy my software twice.

I think your magazine is great, a credit to a great machine. Keep up the good work.

P.S. In fairness to Mr. Anderson, he made some valid observations. I agree with him that password removal is wrong.

Doran A. Jones
El Cajon, CA

I'd like to take issue with "Taking Sides" in the Summer issue. Anybody

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with any knowledge of WYSIWYG knows that two versions have evolved over the past several years. As Rhett Anderson pointed out, the original concept was to show 80-column screens of what your printer produced on paper before it was printed. Italics, bold, and underline features were "shown" onscreen by highlighted text with hidden commands which could be viewed quite simply. Later word processors showed bold, underline, italics, and other features directly on the screen and were touted as being "true" WYSIWYG.

I'm typing this with *WordPerfect* using its text WYSIWYG interface. I could have typed it with *ProWrite* or *Excellence!* using their graphics WYSIWYG interface. Anyone who states that text WYSIWYG is not necessary in today's world is nuts. Likewise, anyone who thinks they can use a graphics WYSIWYG interface for everyday business correspondence is equally nuts.

So why take sides on WYSIWYG when there are obviously two different types out there? I use both interfaces, as I'm sure many people do. I will take issue with the term *WYSIWYG*, however. It's a stupid abbreviation which I'm sure time will kill. The only thing more stupid is Randy Thompson's childish comment about Anderson's "deep-seated fear of computers." It's easy to argue against what you exaggerate, something that Madison Avenue and politicians love to do. That's against the rules of formal logic, and logic is what any good programmer must have. I doubt Randy Thompson could write two lines of BASIC code, judging by these statements. And for that matter, why does *Amiga Resource* even print such trash?

James D. Creasy
Danville, PA

It seems we've created a monster. From the letters we get, we must assume that "Taking Sides" is simultaneously the most popular and least popular of our columns. For those of you who have written to tell us how much you like "Taking Sides," don't worry—Rhett and Randy aren't likely to run out of arguments anytime soon. As for the rest of you, we suggest you use this page for kindling, or some other appropriate task. Following are responses from columnists Rhett and Randy.

Rhett responds:
I wouldn't accuse Doran Jones of being a pirate. But I think we all should think carefully about how we are using disk copiers. With such a powerful tool, it's easy to slide into unethical practices.

And Mr. Creasy, while I would hesitate to argue that Mr. Thompson is not childish, he is indeed quite a good programmer. In fact, COMPUTE! originally hired him as a programmer two years ago. The impressive "X-Ray" in the Summer issue can be counted among his achievements, as can the popular column "Programmer's Page" in COMPUTE!'s Gazette, *one of our sister magazines.*

Randy responds:
Disk copiers, such as the excellent Project D *from Fuller Computer Systems, are indispensable computing tools, as I think anyone who has lost a program because they were unable to make a backup will agree.*

My "childish" statement that Mr. Anderson is afraid of computers (and modems and fax machines) came straight from the horse's mouth—Mr. Anderson's, that is. I must admit I neglected to lay a proper foundation for this remark, but it is a direct quote that almost everyone at COMPUTE!'s editorial offices has overheard Mr. Anderson mumble from time to time. In all fairness, he seems to be joking, but sometimes you wonder.

Four-Joystick Standard

After reading Shay Addams' article on multiplayer games (Summer 1989), I would like to raise an aspect of this topic which should be of interest to Amiga game enthusiasts. While enjoying great games on our computer, we are often frustrated at the inability to have more than two simultaneous participants in action games, particularly team sports. ("Musical controllers" and backseat coaching become important activities.)

We were recently encouraged when we noticed an advertisement for an Amiga soccer game which allows up to four players to participate with an optional adapter. Is there in fact a standard convention for game developers to provide this feature? If not, I think we should encourage one.

Edward A. Lowe
Vancouver, B.C., Canada

The game you saw advertised was International Soccer *($39.95) from Microdeal. It uses an adapter that plugs into the printer port to support the extra joysticks. The adapter is available from Microdeal (a division of MichTron) for $14.95. We wholeheartedly encourage game developers to support Microdeal's standard. Interested parties can obtain public domain source code for reading the extra joysticks from MichTron, 576 South Telegraph, Pontiac, Michigan 48053.*

Why COMPUTE! Doesn't Sell Hardware

I just bought the Amiga 500 plus other hardware from our base exchange at Lowry/Denver.

To expand the memory, I wanted to buy the Commodore A501. However, the base exchange is out and doesn't know when it will get more in. Could you please tell me when you will ship more to Denver? Or do I buy this item from you direct?

Also, is there a release date yet for the A590?

H. W. Holzmann
Denver, CO

It happens all the time. Readers write to us and ask if we can ship them a new ROM for their Commodore 1571 drive, a replacement VIC II chip for their Commodore 64, a ribbon for their

discontinued Commodore printer.

Readers have long confused COMPUTE! with Commodore, mainly because of the support given to Commodore products in COMPUTE! *and* COMPUTE!'s Gazette. *Further confusing the matter is the fact that Commodore used to have its own publication,* Commodore Magazine, *which covered the 64, 128, and Amiga.*

We won't be shipping any A501s. And frankly, we're not absolutely sure when Commodore will ship the A590. However, we know some of them are out there already (see Arlan Levitan's column in this issue), and we suspect that Commodore will be shipping them in full force by the time you read this magazine.

COMPUTE! isn't interested in selling hardware. We concentrate on magazines and disks. However, many of the mail-order advertisers in this magazine would love to take your order. Give one of them a call if your dealer is unable to get you an item.

Type-in Listings

I read your magazine's Summer issue with great interest. I'm not a fan of disk magazines, as they cost significantly more than regular magazines, and the public domain programs they usually contain are available for less on local bulletin boards.

I was thrilled when I found out that I could buy your magazine without the disk. However, when I began to read the more technical articles, I was astounded that the source code wasn't printed in the magazine. Was there some reason that it was left out? Reading an article that refers to code you don't have access to is a rather frustrating experience. Ten full pages (excluding advertising) were devoted to programs that I would have been able to type in if the source code had been listed in the magazine.

Bill Cavanaugh
Bloomfield, NJ

Printing source code in the magazine would be ideal, but the number and size of our programs makes it quite impractical. Our "On Disk" source code listings are so long that they would literally double the size of the magazine, thereby increasing its price. Please note that we always list the source code for "Ask Rob Peck" and "The Programmer's Page" because you

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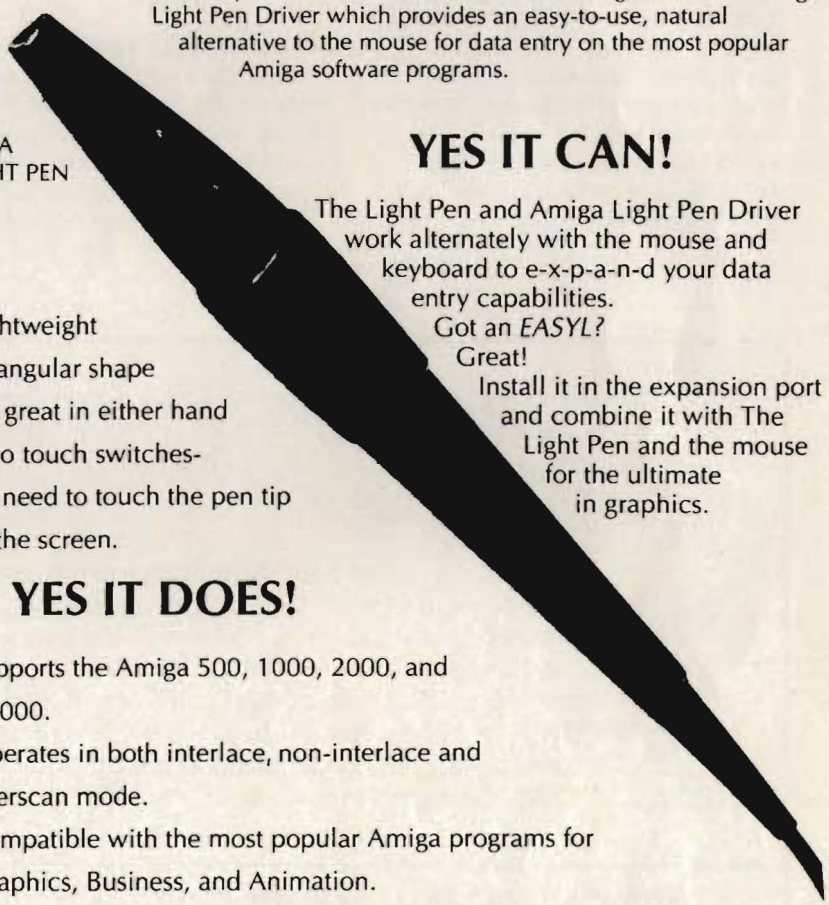

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FEEDBACK

need it to understand the programming concepts presented in these columns. Readers interested in the source code for our feature programs can always find it on the Resource Disk.

It's doubtful that anyone would really want to type in large Amiga listings, especially when you can purchase the ready-to-run programs on disk for only $9.95. The source code for "X-Ray," for example, is over 16K, and this is one of our smaller utilities. "Advanced Laser Chess" source code is more than 140K—that's about 24 solid pages of very small type! Besides, many of our programs require digitized sound files and IFF pictures. Such files can't readily be typed in. Providing source code on the Resource Disk *seems the only viable solution.*

We agree with your comment on disk magazines that mainly resell public domain software. That's why Sheldon Leemon's "Best of the Boards" column provides one or two select PD programs while our feature programs, which make up the majority of the Resource Disk, *are completely original and available only through us. By keeping much of our program development in-house, we can offer exclusive, top-quality software at a fair price.*

Easy-Access Joystick Ports

Here's a small tip that I hope you will be able to use. On the Amiga 500, the joystick/mouse ports are at the rear of the computer, making them almost impossible to see when you're plugging in joysticks, mice, or dongles. A cheap fix for this is to purchase a joystick extension cable (such as Radio Shack part #270-1705). Simply connect the extension cable to the 500's second joystick port and route it to a convenient spot on your desk. Now when you have to plug something in, all you have to do is plug it into the extension cord instead of fumbling around at the back of your computer, thus eliminating possible damage to the ports or connectors. Even though their joystick ports are easier to access, Amiga 1000 and 2000 owners may find this tip useful, too.

Stuart Attwood
Thompson, N.B., Canada

Thanks for the tip, Stuart. A few of us at COMPUTE! have our computers wired this way and find it quite useful. ▲

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ASK ROB PECK

Rob Peck

Playing Sampled Sounds

How do I play a sampled sound?
Tom Zananovich
San Francisco, CA

There are two basic procedures that you must learn in order to play a sampled sound. The first thing you must know is how to read (and interpret) an IFF sound file so you can move appropriate parts of it into memory and then find the parameters that describe how the sound was recorded. Note that if sound data is to be played by the audio device, it must be located in chip memory.

The second thing that you must learn is how to handle the audio device—how to open it, grab a channel, create a data structure that describes where the sound data is located and how it is to be played, tell the channel to play it, and then free the channel and close the audio device. The program presented here, PlaySample, does all of these things. See PlaySample's C source code on the following page.

To use the program, copy it from the c directory of the *Resource Disk* to the c directory of your Workbench disk and enter the following from the CLI:

PLAYSAMPLE *filename*

where *filename* is the name of the IFF sampled sound. The *filename* parameter can be a complete path, such as RAM: MySound. Workbench users can access this program simply by clicking on the PlaySample icon. This invokes a special script file that automatically plays a sound using the command PLAYSAMPLE Hello.sample.

PlaySample assumes that the sound is an 8SVX IFF sampled sound, with just a one-shot sample and no loop (the one-shot sample *must* have a length greater than 0). A one-shot sample means that the data is played only once. If there were a loop, part of the audio data would be repeated many times, as on an organ when a key is held down for a long period of time. The one-shot part might be the attack portion of the sound, and the loop part might be the sustain portion of the sound.

The IFF 8SVX file format is used by many Amiga music programs to store audio data for sampled sound instruments. All commercially available sound samplers are able to save sound in this format. In addition to the one-shot data, IFF 8SVX may contain several other types of data *chunks* (a section within an IFF file that is used to hold data or describe something about the file). For the purposes of this article, we are interested in only two types of chunks, namely those identified as VHDR and BODY.

A VHDR chunk describes the type of data that is found in the BODY chunk. PlaySample places the VHDR chunk into a Voice8Header structure, defined near the top of the program's source code. To explain some of the VHDR entries, let's examine what the BODY chunk contains using the labels defined in the Voice8Header structure.

The first *N* bytes in BODY (*N* = oneShotHiSamples + repeatHiSamples) contain the raw sound data for the highest octave of the sampled sound. The BODY chunk contains ctOctaves of data, where each succeeding octave contains twice as much data as the preceding octave. For example, if there are three octaves of data present, the total number of bytes in BODY will be N + (2 * N) + (4 * N).

For the purposes of this article, PlaySample concentrates only on the first octave of the oneShotHiSamples within the BODY chunk. However, PlaySample does store all of the sound data, so it's available for anyone who wishes to modify the program to handle other cases.

The samplesPerSec is the rate at which the samples were recorded, and, of course, also the rate at which we want to play them back. The parameter sCompression is ignored, though if the sample were saved in a compressed form it would have to be expanded. For information on decompressing 8SVX files, please see the *Amiga IFF Document* or the IFF section of the *1.3 Amiga ROM Kernel Manual: Includes and Autodocs.*

As you might guess, the volume parameter is supposed to define the volume of the sampled sound. The information about volume in the IFF manual is somewhat vague, however. Knowing that my sample was recorded at a volume level of 64 (the maximum acceptable to the audio device), and the VHDR volume parameter for the same sound was 65536, I shifted it right ten binary positions (v.volume >> 10) to yield the value of 64 that belongs in the Amiga's volume register. In reference to the volume parameter, the official IFF documentation says that it "should be multiplied by some value, such as that in an ATAK or RLSE chunk before being applied to the system volume register." My PlaySample program ignores any such chunks, so for now, shifting the number right ten times (which is the same as dividing it by 1024) seems to be a workable solution.

The PlaySample program is composed of several subroutines. I'll define the function of each one. You may find some of them useful in your own programs.

FindBlock( ) accepts an AmigaDOS file handle and four character parameters. Starting at the current file position, it searches the IFF file (by character pairs) for the four characters passed to it. It's designed to look for the four-character label—such as VHDR or DATA—which identifies a particular chunk. When it finds the characters, it assumes that they are part of an IFF structure and returns the size of the chunk. Note that if the characters being sought are actually a part of a chunk's data body, this function will return an incorrect size value. But we take that chance here, for simplicity. If you want a full-blown

IFF parser library, take a look at Fred Fish disk #173 or a more recent offering from Leo Schwab, soon to be on a Fish disk near you. In PlaySample, FindBlock( ) is used to first find the VHDR chunk and its size, then the BODY chunk and its size.

The functions GetVHDR( ) and GetBODY( ) use FindBlock( ) to locate these chunks. GetVHDR( )'s job is to fill in the Voice8Header data structure (v). GetBODY( )'s job is to allocate memory for the audio data and to read it into memory. The main program has access to the memory address (memAddr) and the size of the audio data (memLength) so it can return this memory to the system when the program is done. A clean exit is a nice exit.

InitBlock( ) prepares an audio I/O request block for sending commands to the audio device.

When passed a TRUE value, GetAnyChannel( ) simply asks the audio device for any channel that it has available. This function will free the channel later when you pass it a FALSE value. As written, GetAnyChannel( ) handles only *one* channel at a time. In other words, use it only for allocating a single channel that will be freed later by the same function. If you break this rule, GetAnyChannel( ) loses track of the first channel you allocated, and you'll never be able to free it. You can find a more general-purpose version of GetAnyChannel( )—and several other useful routines—in my AudioTools programs found on Fred Fish disk #94.

LoadSample( ) copies the data from the IFF file into memory and returns a TRUE value if it's successful and FALSE if it's unsuccessful. Finally, the main( ) part of the program puts everything together and plays the specified sound.

What is *not* here? Well, as mentioned above, there is no support for the repeat part of a sound and no support for the ATAK or RLSE chunks—the envelope functions. But it does, I hope, give a basis on which others can build. And a nice side benefit is that now there is yet another function that can be added for the next release of my AudioTools programs. Perhaps before that happens, I can also find out how the volume parameter is *really* supposed to be handled.

Well, see you next time. Keep the questions coming!

If you have a programming question or problem that you'd like answered, write to Ask Rob Peck, COMPUTE!'s Amiga Resource, *P.O. Box 5406, Greensboro, North Carolina 27403. We regret that, due to the volume of mail received, we cannot respond to every question.*

PlaySample

```
#include <exec/types.h>
#include <exec/ports.h>
#include <exec/io.h>
#include <exec/memory.h>
#include <devices/audio.h>
#include <libraries/dos.h>
#include <libraries/dosextens.h>

/* from Electronic Arts IFF definitions */

typedef struct Voice8Header {
    ULONG oneShotHiSamples,
          repeatHiSamples,
          samplesPerHiCycle;
   UWORD samplesPerSec;
   UBYTE ctOctave,
          sCompression;
   LONG  volume;
};
LONG Read();

struct FileHandle *fh, *Open();
APTR   sample;  /* where the sample resides once read */
struct Voice8Header v;

APTR   memAddr=NULL;      /* remember where audio data is stored */
LONG   memLength=0;

WORD             key=0;
struct Unit      *unit=NULL;
struct IOAudio   audioIOB;
struct Device    *device=NULL;
struct MsgPort   *auReplyPort=NULL;
struct MsgPort   *CreatePort();
UBYTE anychan[4] = { 1,2,4,8 };

WORD channel;

UBYTE *chipaudio=0;      /* dummy value */
LONG datalength=0;       /* dummy value */

/* Locate a block of a particular type in an IFF file and
 * return the size of the block.  The file handle is positioned
 * at the first byte of the block to be read, so if it is a
 * data structure, you can "Read(fh,&datastruct,size)" where
 * size is the size of the data structure that findblock returns.
 * Searching begins at the current position in the file specified
 * by the file handle.  Assumptions: File is open, file handle
   is valid. */

LONG
FindBlock(fh,c1,c2,c3,c4)
char c1,c2,c3,c4;
struct FileHandle *fh;
{
    LONG i, filesize, status, current;
    LONG junk, size;
    UWORD chpair, *cc;     /* look at pairs of characters */
    UBYTE *c, *d;

    cc = &chpair;  c = (UBYTE *)&chpair;  d = c + 1;

    status = FALSE;     /* not found */

    current  =  Seek(fh, 0, OFFSET_END);
    filesize = -current + Seek(fh, current, OFFSET_BEGINNING);
    /* back to current position to continue search from here */

    *c = '0'; *d = '0';

    for(i=0; i<filesize-2; i+=2)
    {
        if(*c == c1 &&  *d == c2)
        {
            junk = Read(fh, cc, 2); /* "could" error check */
            if(*c == c3 && *d == c4)
            {
                status = TRUE;
                junk = Read(fh, &size, 4);
                /* "could" error check, junk should = 4 */
                break;
            }
        }
        junk = Read(fh, cc, 2);
    }
    if(status) return(size);  else return(NULL);
}


struct Voice8Header *
GetVHDR(fh, vh)
struct FileHandle *fh;
struct Voice8Header *vh;
{
    LONG size, check;
    size = FindBlock(fh,'V','H','D','R');
    if(size != 0) {
       check = Read(fh, vh, 20);
       /* or could specify "sizeof(*vh)" instead of 20 */
    }
    if(check != 20) {
       printf("Unexpected end of file during read VHDR!\n");
       return(NULL);
    }
    else return(vh);
}

/* Use FindBlock to locate the next BODY chunk in the file.
 * Allocate enough memory in MEMF_CHIP to hold it all, and
 * return a pointer to the start of that memory.  Return 0
 * if not enough memory or if BODY chunk not found.  Search
 * begins at the current position of the file handle pointer
 * to allow an IFF LIST structure to be searched if desired.
 */

APTR
GetBODY(fh)
struct FileHandle *fh;
{
    LONG  size, check;     /* size is returned in bytes     */
    APTR mem, AllocMem();  /* pointer to allocated CHIP RAM */

    size = FindBlock(fh,'B','O','D','Y');
    mem = AllocMem(size, MEMF_CHIP);
    if(mem == 0) {
       printf("No space for audio sample.\n");
       return(NULL);
    }
    check = Read(fh, mem, size);
    if(check != size) {
       printf("Unexpected End Of File.\n");
       return(NULL);
    }

    /* remember where we put it so we can free it later */
    memAddr   = mem;
    memLength = size;
    return(mem);
}


/* Initialize an audio I/O block for default CMD_WRITE operation. */
int
InitBlock(iob)
   struct IOAudio *iob;
{
```

```
    iob->ioa_Request.io_Device = device;
    iob->ioa_Request.io_Message.mn_ReplyPort = auReplyPort;
    iob->ioa_Request.io_Unit = unit;
    iob->ioa_AllocKey = key;  /* Allocation key */
    iob->ioa_Data = chipaudio;  /* pointer to CHIP mem for wave */
    iob->ioa_Length = datalength; /* length of the sample */

    /* Another routine, must initialize:

       period     (ioa_Period),    volume    (ioa_Volume),
       cycles     (ioa_Cycles),    message   (ioa_WriteMsg)
    */
    iob->ioa_Request.io_Command = CMD_WRITE; /* default */

    /* If IOF_QUICK is zeroed, this would affect the
     * period and volume.  If a CMD_WRITE, it queues if
     * another note is already playing.  We queue CMD_WRITE.
     */
    iob->ioa_Request.io_Flags = ADIOF_PERVOL;
    return(0);
}

int
GetAnyChannel(status)  /* TRUE means get one, FALSE = dump it */
int status;
{
    int error, value;
    struct IOAudio *iob, controlIOB;

    iob = &controlIOB;
    InitBlock(iob);   /* init it for CMD_WRITE, then change it */

    iob->ioa_Request.io_Message.mn_Node.ln_Pri = 20;
    if(status == TRUE) iob->ioa_Request.io_Command = ADCMD_ALLOCATE;
    else iob->ioa_Request.io_Command = ADCMD_FREE;

    iob->ioa_Data                  = (UBYTE *)anychan;
    iob->ioa_Length                = 4;
    iob->ioa_Request.io_Flags      = ADIOF_NOWAIT | IOF_QUICK;
    BeginIO(iob);

    error = WaitIO(iob);  /* returns nonzero if error */
    if(!(iob->ioa_Request.io_Flags & IOF_QUICK)) {
        GetMsg(iob->ioa_Request.io_Message.mn_ReplyPort);
    }
    if(error) {
        return(-1L);
    }
    unit = NULL;  key = NULL;
    if(status) {
       switch((LONG)(iob->ioa_Request.io_Unit)) {
         case  1:   value = 0;   break;
         case  2:   value = 1;   break;
         case  4:   value = 2;   break;
         case  8:   value = 3;   break;
         default:   value = -1;  break;
       }
       if(value == -1) return(-1L);

       unit     = iob->ioa_Request.io_Unit;
       key      = iob->ioa_AllocKey;
       return(value);
    }
    else return(0);
}


int
LoadSample(filename)
char *filename;
{
    struct Voice8Header *vh, *retvh;

    vh = &v;

    sample = NULL;
    memAddr = NULL;

    fh = Open(filename,MODE_OLDFILE);

    if(fh == 0) {
      printf("Can't find file '%s'.\n",filename);
      goto cleanup;
    }

    retvh = GetVHDR(fh, vh);

    if(retvh == NULL) {
      printf("Can't locate VHDR in file.\n");
      goto cleanup;
    }
    printf("Number of one shot high samples is: %ld.\n",
           v.oneShotHiSamples);
    printf("Number of samples per second is: %ld.\n",
           v.samplesPerSec);

    sample = GetBODY(fh);

    if(sample == NULL) {
       printf("End of file or not enough CHIP RAM.\n");
       goto cleanup;
    }
    return(TRUE);
cleanup:
    return(FALSE);
}

main(argc, argv)
int argc;
char *argv[];
{
      LONG p1, p3, p4, period;
      WORD p2, p5;
      struct IOAudio audioIOB;
      int chan, error, success;

      device = 0; auReplyPort = NULL;
      fh = NULL;  sample = NULL;

      if(argc < 2) {
          printf("Format is: playsample <filename>.\n");
          exit(20);
      }
      /* assume success */
      success = LoadSample(argv[1]);
      if(success == FALSE) goto cleanit;

      auReplyPort = CreatePort(0,0);  /* assume success */

      InitBlock(&audioIOB);

      /* Open device but don't allocate channels     */
      audioIOB.ioa_Length = 0;   /* (no allocation table) */

      error = OpenDevice("audio.device",0,&audioIOB,0);
      if(error) {
          printf("Cannot open audio device.\n");
          goto cleanit;
      }
      device = audioIOB.ioa_Request.io_Device;

      chan = GetAnyChannel(TRUE);
      if(chan <0) {
          printf("Cannot allocate a channel.\n");
          goto cleanit;
      } else printf("Got channel %ld this time.\n", chan);

       p1 = 1000000L;
       p2 = v.samplesPerSec;

       p3 = p1/p2;    /* sample rate, samples per sec */
   /* microsec/sample = 1000000 microsec/sec div by samples/sec */

       p4 = p3 * 10000;
       p5 = 2794;

       period = p4 / p5;

  /* period = X microsec per sample / 0.279365 microsec/interval */

      InitBlock(&audioIOB);

      audioIOB.ioa_Data = (UBYTE *)sample; /* ptr to waveform */
      audioIOB.ioa_Length = v.oneShotHiSamples;
      audioIOB.ioa_Period = period;
      audioIOB.ioa_Volume = (v.volume)>>10;
      audioIOB.ioa_Cycles = 1;

      BeginIO(&audioIOB);
      error = WaitIO(&audioIOB);

      InitBlock(&audioIOB);
      chan = GetAnyChannel(FALSE);
      printf("Freed the channel.\n");
cleanit:
   if(auReplyPort) DeletePort(auReplyPort);
   InitBlock(&audioIOB);
   if(device) CloseDevice(&audioIOB);
   if(fh)  Close(fh);
   if(memAddr) {
        FreeMem(memAddr, memLength);
```


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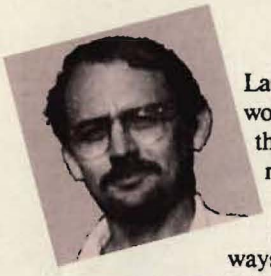
To Live and Die in L.A.



Last week I visited yet another strange world. It wasn't Skara Brae, Britannia, or the Great Underground Empire, but rather was a real world for a change: The World of Commodore. Until last year, this open-to-the-public show always took place in Canada (reportedly because Paul Shaffer, who heads up the band on David Letterman's "Late Night," is Canadian, and apparently owns a majority of Commodore's stock as well as significant holdings in the back-bacon industry). Following a successful Philadelphia event in 1988, however, they decided to host one in Los Angeles this June. Since many of the big-time software publishers were then gearing up for the summer Consumer Electronics Show (to market Christmas releases) or the Software Publishers Association Awards show, most exhibitors were small-scale software publishers and hardware manufacturers, software retailers, major computer magazines (such as the one you're reading at this very moment), and local user groups.

MicroIllusions, however, arrived in force and was armed with plenty of products to show. David Boyles gave me a tour of *The Jetsons,* the most promising new game I saw at the three-day event. I flew Jetson's car to Cogwells Cogs, witnessing impressive, panoramically scrolling graphics and cinematic effects such as dissolves and fades. It's a no-typing-required adventure that offers click-on menu selections for interacting with other characters. The mouse and icon interface reminded me of ICOM's *Deja Vu.* You can click on things in the picture and watch them open up to reveal their contents in a fresh window; to exit a door, you can click on its little box in the map. According to my hastily scribbled notes, the goal has something to do with robots—but you won't have to worry about getting killed by them in this fantasy world, as Hanna-Barbera banished death from *The Jetsons* by ruling out violence right from the start.

Boyles rolled his eyes when I asked what happened to *Land of Legends,* the lushly illustrated role-playing game MicroIllusions showed at the Vegas CES over a year ago. The story is that the designer, David Joiner (who did *Faery Tale Adventure*), has been diverted from it to work on a music program for the past year. Now he's back again, slaving away in the dungeons, which should be ready for you to explore this fall. *Land of Legends* will be followed with a dungeon construction set that will let you create mazes, monsters, and more for games of your own design.

Because MicroIllusions was the only exhibitor that put out a spread of food and drinks for the press, I spent most of the day there, surreptitiously stuffing popcorn and Perrier into my attaché case for lunch later on while I played some of the company's upcoming arcade titles. *Dr. Plummet's House of Flux* sent me reeling back to the days of the original *Asteroids* arcade game, for you fly a space ship through assorted mazes and other challenging setups in a finely animated search for the doctor. Gravity and other effects lend variety to the seven events found on each of the four levels. *Tracers,* yet another arcade-style game, has a *Centipede* feel to it.

Seeing the release of so many new action games for the Amiga at a time when Nintendo is gobbling up that section of the entertainment market faster than Godzilla did Tokyo, I wondered how many of them will wind up being converted for the Nintendo. MicroIllusions won't say more than that they're "looking at going to NES" (Nintendo Entertainment System), the same thing I hear from Electronic Arts and Activision. But I'm willing to bet that a year from now you'll have a serious quest on your hands if you're looking for a new action game for almost any home computer other than the Amiga.

> Nintendo is gobbling up the arcade-entertainment market faster than Godzilla did Tokyo.

That's because some arcade machines are really Amiga computers in disguise, opening the way for more than just arcade machine–to–home computer conversions. According to Annette Childs, Mastertronic is leading the way with its new MegaGames label. These are sports games that originated in the arcades and will soon be available on disk for your Amiga at home—not conversions, but the real thing. *Magic Johnson's Basketball, Rick Davis' World Trophy Soccer,* and *New York Warriors* are the first MegaGames titles. These call for a minimum of one megabyte, but they may be converted for 512K Amigas (in which case, they'll vary somewhat from the originals).

Occasionally a company specializing in games will take a shot at the applications side of the business. In an unexpected role reversal, Gold Disk, the Canadian outfit known for "serious software" such as *Professional Page,* just started up an entertainment arm, Hardwired, that's importing European action games like *Jinx* for the Amiga and Nintendo. (It's not the first time this has happened: Microsoft published a version of *Original Adventure* a decade ago, and *Zork* was originally marketed by the

publishers of *Visi-Calc,* the original spreadsheet program for Apple number-crunchers.)

A number of *Donkey Kong*–style ladder games I saw at the show were posing as action adventures. *Aunt Arctic Adventure,* with its misleading name and plot description (rescue your aunt, who has been kidnapped), for example, turned out to be a 50-level ladder game alive with sword-wielding Eskimos. They might as well have called it *Aunt Arctic's Flight Simulator.* If you like ladder games, you won't care what they call it on the box; adventurers, however, should pay close attention to the name of the designer or publisher.

I suddenly found myself paying extra-close attention to the Free Spirit Software booth, though for some reason I focused on its game graphics and totally overlooked the designer's name. Aiming to deliver the kind of adult-oriented game with which *Leisure Suit Larry* and *Leather Goddesses of Phobos* only teased us, Free Spirit just unleashed *Planet of Lust,* the sequel to *Sex Vixens from Space* (a debugged version of which is now available). Both are graphics adventures with erotic art and titillating text. For those who prefer tamer thrills and a more conventional quest, the company has one called *The Last Inca.*

After the show, I had trouble finding the freeway to return to Arizona and wound up staying in L.A. a few more days. I decided to drop in unexpectedly on some of the game companies in the area, just to make sure these places really exist. (Call me paranoid, but I figured that if I'd made an appointment weeks in advance, they'd have had time to rent an office and some furniture if they were actually working out of a mobile home in Venice Beach.) My first stop was at Mindcraft, where *Rings of Zilfin* and *Magic Candle* author, Ali N. Atabek (known in certain circles as "Muhammed Ali" Atabek), confirmed rumors that there is a possibility that his adventure hit *Candle* will be converted for the Amiga.

Then I battled metal death on the L.A. freeways to see Jon van Caneghem at New World Computing. After circling the block for half an hour, I finally gave up on the last puzzle of my quest (to find the building) and resorted to calling New World's customer help line for a clue. The first thing I saw once I finally arrived was a beta version of *Nuke War,* based on one of the classic play-by-mail games run by Flying Buffalo, which now moderates similar games on CompuServe as well as via regular mail. It's been made into a one-player strategy game (with an option for multiple players) in which enemy missiles and bombers arc over a map of the U.S.A. as you strive to wipe out the enemy. This one should be out this fall.

Read/Write Media—Eric McMillan

Sword, rope, and lantern—required equipment for explorers of L.A.'s World of Commodore.

Though there was nothing to see yet, *Might and Magic II* is being converted for the Amiga. Why not the first game, you wonder? What sort of logic leads a company to release book 2 in a series before book 1, you ask? The sort that keeps you, the Amiga gamer, in mind. And the graphics in the first game "wouldn't do justice to the Amiga," according to New World, so the company chose not to convert it at all. *M & M II,* however, introduced animation and graphics with twice the resolution of *M & M I,* so you won't be disappointed with this conversion.

I also got a peek at a pair of games that are sound candidates for eventual Amiga conversions. *Tunnels and Trolls,* based on Ken St. André's paper-and-pencil role-playing game of the early sixties, was designed by *Wasteland* contributor Liz Danforth. Its wacky sense of humor distinguishes it from typical fantasy quests. *Hunter* is a futuristic role-playing game in which you're out to nail a series of villains. The twist is that you are assigned different targets in each new game, which gives it extra replay value rarely found in a role-playing game. Both are still under development, so don't expect to see these on the Amiga till next year.

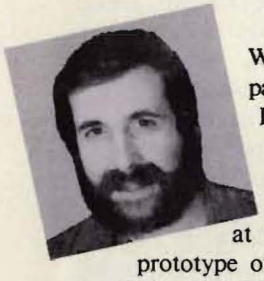
The big surprise I uncovered during my unannounced visit to New World, however, did not turn up in a game at all—but in the discovery that *Dungeons & Dragons* co-creator Gary Gygax (who ambled down the hall like Mr. Natural from the R. Crumb comic strips) was meeting with Jon van Caneghem that day. Jon had no comment as to whether Gygax is designing an adventure for New World, but he certainly wasn't delivering a pizza.

A pizza was just what I needed by this time, so I jumped into the QuestMobile and headed for the beach. By then I'd had time to reflect on the show and what it all means for Amiga gamers. I saw more new games for the Amiga than I did for the 64, and everyone agreed this trend will continue (though Commodore is having as much trouble killing the 64 as Coca-Cola had with Coke Classic!). While the software industry has been in a serious slump the first half of 1989 (Epyx was rumored to be up for sale, Activision shut down Infocom's Cambridge office, and other major game companies are suffering from unusually soft sales as Nintendo bites deeper into the market), you can still count on more new Amiga titles (especially action games) as we draw closer to the Christmas season. So as the sun set slowly in the west, I pointed my headlights east on I-10, and all the way home pondered the hottest rumor at the show: The next one will be held in South America . . . and they'll call it The Third World of Commodore. ▲

ABSTRACTIONS

Arlan Levitan

Unsolved Mysteries



While I'm still too groggy from extended party hopping at last June's Consumer Electronics Show to devote an entire column to CES, one Amiga-related item is worth taking note of in passing.

One of the most popular exhibits at CES was ESP's BattleTech Center, a prototype of a computer-based multiplayer battle simulation that ESP would like to franchise on a national basis. According to ESP, the typical BattleTech center would be located in high-traffic shopping malls, where bored yuppie juveniles and adults will pay five to six bucks an hour to lock computerized horns with up to seven other players. The participants are seated in futuristic cockpits with multiple screen displays and full-size controls for maneuvering and weapons. The prototype that ESP demonstrated at the show consisted of four cockpits linked together in a simulation of warfare between giant robots. While there were a lot of rough edges on the demo system, the quality of the gameplay was markedly enhanced by terrific graphics presented on the cockpit's main battle screen. Add convincing stereo sound, and you have an utterly engrossing multiplayer showdown.

As I played, an ESP employee told me that the BattleTech system was built around "three custom-designed high-powered computers." I participated in several five-minute rounds of BattleTech, and as I became more comfortable with the simulation, I began to study the game graphics in greater detail. After a few rounds, I suspected that at least one of the "custom-designed" computers was an old friend. While one of my associates engaged the attention of two ESP staffers, I slunk around to the back of one of the cockpits and jammed my face against the perforated grate covering the electronic innards. The light was dim, but I found what I was looking for and walked back to the front of the cockpit, where my friend was still engaged in ESP-ish conversation. I waited for an appropriate opening and asked the $64,000 (or is that 68000) question: "The main battle program, graphics, and sound all run on an Amiga 500 motherboard, right?"

To his credit, the ESPer smiled wryly and responded with candor and openness, two fairly scarce commodities in this business. "Right," he affirmed. "Of course, the local area network and inter-Amiga communications hardware is handled by the boards that Incredible Technologies did for us."

> Jamming my face against the cockpit's perforated grate, I found the component that I was looking for.

I don't know if ESP was successful in flushing out any potential venture capital for funding BattleTech in a big way, or for that matter, if any BattleTech centers will ever open. One thing we do know is that if BattleTech does come to life, it has a heart capable of pumping long and strong.

Commodore's public relations department could benefit greatly by acting more like the forthright ESP employee I spoke with. Those walking, talking, empty handshakes are apparently unwilling to provide any clues regarding the mystery of the Commodore A590 Hard Drive Plus. Over the last few months, I've received a half-dozen or so puzzled pieces of electronic mail from readers who followed my A590 experiences in our last issue of *Amiga Resource*. Apparently many of you have searched high and low for a Hard Drive Plus to no avail, and there are indications that your time might be better spent in searches for the Holy Grail or Jimmy Hoffa.

About a month ago, one of my editorial cohorts was asked by a Commodore public relations spokesperson to strike mention of the A590 from a review of the Amiga 500 I wrote. The reason served up for axing the plug was that A590 drives would not be available for some time.

I was somewhat incredulous of that claim, in light of the A590 sitting on my desk and the acknowledged lack of credibility of the PR person in question. My unit wasn't obtained using any kind of journalistic pull; it came from my local dealer. In an effort to dig out the truth, I left several pointed questions in an online conference I knew to be frequented by Commodore employees. On May 11, I received the following reply from the engineer at Commodore in charge of the A590:

"I've been trying to find out why there have been no magazine reviews of the A590 yet, and it seems that it takes a conscious effort in this company for that to happen (that is, it doesn't happen automatically). So far, though, it seems as if it is lack of action that has caused no magazine reviews to occur, not some misguided sense of Lack-of-Units. I'm trying my best to get the situation rectified, so the flood gates should be opening soon, hopefully."

Other messages told me in no uncertain terms that A590s were selling hand over fist, with most of them going to the European market. I chalked the episode up as a glitch in supply that would be resolved shortly. However, a month and a half passed, and A590s were still nowhere to

be seen on most Amiga dealers' shelves. Things got downright weird yesterday, when a local dealer informed me that he tried to order the drives from his Commodore sales rep and was told that A590s are not available because they "don't work."

Tell that to my own Hard Drive Plus, which continues to be as happy as a clam after having its empty chip sockets stuffed with two megabytes of dirt-cheap RAM. In a spastic fit of masochism, I decided to call the PR department at Commodore again. Can you say *stonewall?* Sure you can! I got two excuses from semisentient beings who decided that they weren't really in after hearing the question, and one lamebrain asked what an A590 is.

In the absence of any hard facts, the scarcity of the HD+ remains a perplexing enigma, but I have a pet theory that makes more sense than anything else I've heard. I'm willing to bet that the A590's disappearing act is related to the recent downswing in the memory-chip market.

Over the last six months, chip costs have tumbled faster than Commodore goes through executive officers. Today's prices are so tempting that even this cheapskate was pushed over the upgrade hurdle by $113 per megabyte of memory. In June, one-megabit RAM chips that fetched prices as high as 40 dollars late last year could be had for as little a 14 bucks a pop in small quantities.

During the Great Chip Drought of 1988, it became common practice for memory-board manufacturers to sell their wares unpopulated, with no memory installed. That was understandable, as the volatility of the RAM market made quoting prices for products with RAM installed a risky proposition. With that in mind, the fact that the A590 had empty sockets for up to two megabytes of RAM didn't seem like much of an anomaly.

Or is it? The Amiga 500 is targeted as a home machine. The majority of 590 purchasers are not likely to be technically astute, a condition that's still not a misdemeanor in most states in the Union. It's an established fact that Commodore doesn't like Joe and Joan Average messing around under the hood of its machines. We've received letters from readers who own Amiga 2000s who have been told that the simple act of inserting an expansion card in the 2000 by themselves voids the factory warranty. Is Commodore's legal department likely to bless the release of a mass-market hard drive that includes instructions on opening up its innards and messing around with internal electronic components? I doubt it.

When silicon is cheap, it makes sense for manufacturers to claim the profits to be had on memory for themselves. I'm willing to wager that as memory prices bottom out toward the end of this fall, Commodore will start supplying A590s with two megs of memory installed. This will kill two birds with one stone. Commodores margins on the A590 (and list price) will increase dramatically, and it won't have to worry about lawsuits from ham-fisted 500 owners who manage to mount a chip or two in their index finger.

Illustration by Harry Blair

Anyone who encounters the King or an A590 hard drive can report it to me.

Until then, A590 sightings may be less frequent than appearances of Elvis at local Burger Kings. On second thought, the two may be intimately tied together. Anyone running into the King, an A590, or the two together can report it to me via CompuServe (70007,3563) or GENIE (ARLANL).

To wrap things up, let me offer Levitan's tongue-in-chip solution for the Amiga Fortune 500 blues. I humbly maintain that the root of the Amiga's lack of acceptance in stuffy corporate boardrooms is clearly related to Commodore's antiquated pricing structure. Both the Amiga 500 and 2000 are far too reasonably priced to be taken seriously by Fortune 500 corporations. Ask Apple why it won't make a cheap Macintosh. It would have to drop the prices of its high-end Macs below the stickers of most popular compact cars.

If an Amiga can outperform pricey IBM and Macintosh systems in specific applications, it should be priced accordingly. Why not triple the list price of Amigas? Corporate purchasing agents wouldn't have to use anything vaguely resembling a logical thought process to OK the purchase of a $15,000 Amiga 2000. Any big-time bean counter knows that if a computer costs more than an IBM PS/2 Model 70 or Mac II, it must be a better machine, right?

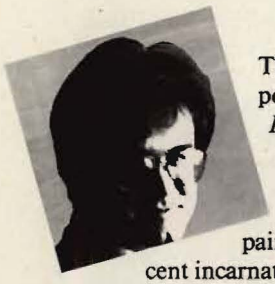
As long as we're realigning Amiga hardware prices, let's put an end to the silly practice of providing a multitasking operating system at no extra charge with the Amiga. If IBM can demand 400–800 bucks for something as lame as OS/2, what's wrong with unbundling the Workbench for $500 or so? While we're at it, let's forget about the Amiga's efficient memory scheme and up the minimum memory requirement for the Workbench to four or five megabytes as well. Have we forgotten any other Amiga anomalies? Whoops! Almost forgot to take BASIC out of the equation as well for another $100+.

That's all for now. Next issue we'll take a look at behind-the-scenes weirdness at this summer's Chicago AmiEXPO, including facedown on-the-floor coverage from the Billy Goat Tavern, where you can always count on low-priced chips (no fries) being available. ▲

SPOTLIGHT

John Foust

DeluxePaint



This month "Spotlight" features the most popular Amiga program of all: *DeluxePaint* (the latest version is *DeluxePaint III*) from Electronic Arts. If beer made Milwaukee famous, then *DeluxePaint* made the Amiga famous. Originally a paint program, *DeluxePaint,* in its most recent incarnation, has also become an animation tool.

DeluxePaint has been a top seller since it was released, and it's the number 1 tool in many an artist's arsenal. It sets the standard for a simple yet powerful user interface.

It is a great compliment to the author of the program that its power and grace holds true for both novices and power users, despite the fact that they each use the program in very different ways. Novices uses the mouse for everything: selecting colors, tools, and menu items. After this, they paint with the mouse. They could do it with one hand tied behind their back.

By comparison, experts rarely click on the tool bar. They choose colors and tools with keyboard commands. The mouse is used strictly for painting. Both hands are in use, shaving away those vital fractions of a second that clog freedom and creativity.

Keyboard-equivalent commands aren't for everyone. If your *DeluxePaint* disk is dusty, don't fret. The tool menu is always there, and you don't need the manual to remember how to doodle. Most of these shortcuts are buried in the *DeluxePaint* manual, if you take the time to find them.

But if you use *DeluxePaint* a lot, then a little memorizing is well worth the trouble. The same principle holds true for the Workbench and the CLI. You'll never forget how to run programs from the Workbench, but it's certainly easy to forget the names and options of CLI commands.

Also known as *hot keys,* keyboard commands are often seen as Amiga-key combinations in a menu, directly to the right of the text for a menu item. Most Amiga programs use the Amiga-Q shortcut to quit the program. Apart from regular Amiga-key sequences, *DeluxePaint* uses ordinary letter keys such as B and C to select painting tools and paint colors.

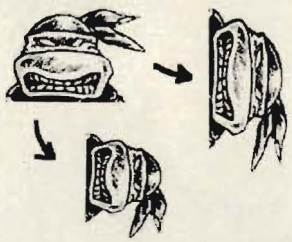


Figure 1: Rotated brushes look better when you use Do Perspective.

• • •

Turn antialiasing on high for great results when you resize brushes.

For example, the N key is a handy shortcut. Press N to scroll hidden parts of the screen into view. If your mouse pointer is in the top half of the screen, the screen scrolls down. If your pointer is in the bottom half of the screen, the screen scrolls up. This trick also works for scrolling the screen left and right. By quickly pressing N as you move the mouse around the screen, you can quickly view the entire picture, even the parts hidden under the menus.

Instead of using the mouse to select a new painting color, use a keyboard shortcut so you won't have to reposition the mouse after the operation. The square bracket keys step through the palette, one color at a time. The comma key lets you pick a color from the painting as if you had clicked on the Color Indicator circle above the palette. The pointer changes to the word *Pick,* and you click anywhere to select a new paint color.

If you watch *DeluxePaint* power users, you'll see them use the B key. This selects the Brush tool to let you cut a brush. Pressing B twice selects the lasso instead of the square brush cutter. You can easily enlarge or shrink both regular and custom brushes with the minus and equal-sign keys. The brush will change in size in very smooth increments. This is much more accurate than using the Brush Size Stretch menu item. You can use H to quickly halve the size of the brush or SHIFT-H to double it.

Changing the size of a brush can lead to complications. In both low- and high-resolution pictures, the screen's dots are almost square, but not quite. (The difference between the vertical and horizontal size of a pixel is expressed as an *aspect ratio.*) If you clip a square brush and use Brush Rotate 90 Degrees to turn the brush on its side, the brush looks just a bit taller than it should be. In medium resolution, the brush will be almost twice as tall as you'd hope, and in interlace, the brush is too wide. How can you rotate a brush without distortion?

The Do Perspective function comes to the rescue. This effect is often used to generate an infinite horizon, like an immense patio tiled with an IFF brush. It can also serve as an artist's aid for perspective drawing. One interesting effect can be created by clipping three brushes and "past-

ing" them on three sides of a cube.

Do Perspective can also rotate and resize brushes with better results than any of the options in the Brush Size and Brush Rotate submenus, but it takes a little extra work. In medium or interlace screen format, if you simply rotate a brush with Do Perspective, you'll get the same results as Brush Rotate 90 Degrees—the brush looks too tall.

Our goal is to rotate and shorten the brush in one step. In Do Perspective mode, we quickly rotate it 90 degrees by pressing SHIFT-1 (you must press the 1 key on the numeric keypad; the 1 at the top of the keyboard does not work for this command). By leaning the brush backward on the *x*-axis with the 7 key, we can pull the bottom of the brush toward us, effectively reducing its height on the screen.

But now the brush looks too 3-D because Do Perspective is outsmarting us. To give a 3-D effect, *DeluxePaint* has made the top of the brush look narrower than the bottom, as if the bottom of the brush were closer to us than the top. Technically, this is called *foreshortening.*

The second half of this trick involves changing the amount of foreshortening, using the > key, or Shift-minus. Pressing this about a dozen times changes the foreshortening so that the top of the brush is the same width as the bottom, even though we had already leaned the brush backward to make it appear less tall.

Figure 1 shows the results of rotating a brush with this method. The original is in the upper left corner. The result of Brush Rotate 90 Degrees is in the upper right corner, and the Do Perspective rotation is in the lower left corner.

Incidentally, architectural photographers use this same trick with an old-fashioned bellows camera. They tilt the rear film plane of the camera with respect to the lens so that the top of the building looks less narrowed. You can use the opposite of this effect, using the < key, to make a brush that vanishes to a point at the top but spreads as wide as the screen at the bottom.

Antialiasing. Both resizing and rotating brushes will benefit from the antialiasing settings in the Do Perspective Settings requester. Simply put, antialiasing makes bumpy lines look smooth. The Amiga uses distinct dots (called *pixels*) to draw every screen. Any diagonal line is drawn as a stairstep pattern of rectangular dots, not as a perfectly smooth line.

Antialiasing fills in the right angle at the base of a stairstep with a color halfway between the color of the line and the color of the background. For example, a white line on a black background should have gray dots in the nooks of each stairstep. A deep blue line on a white background should have pale blue dots in the nooks (see Figure 3). To your eye, the antialiased line looks much smoother than ordinary lines.

DeluxePaint searches your color palette for a good halfway color. If it can't find a suitable color, the antialiasing will be poor. If you plan on using antialiasing, be sure to set aside at least two or three colors in the range between the object color and the background color. You can use the Spread function in the palette requester to make this kind of range.

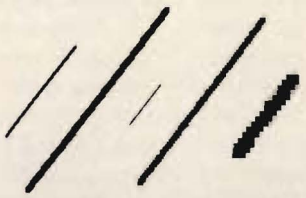


Figure 2: Antialiasing makes bumpy lines look smooth.

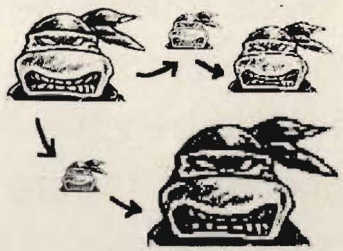


Figure 3: Resizing brushes with Do Perspective adds shading to the image.

Antialiasing will often run faster if you push the *DeluxePaint* screen to the back. If you don't click anywhere, the Zzz pointer should be visible, and it will change back to normal when the program has finished.

Resizing brushes. Resizing a brush with antialiasing on High brings great results. Figure 2 shows a black-and-white image converted from *MacPaint* format. The original art is in the upper left corner, actual size. Sizing the brush with the minus key led to the brush in the upper center, shown enlarged in the upper right corner. The brush is drawn in only black-and-white. Some pixels from the original brush are missing, making it look coarse.

Reducing the size of the original brush with Do Perspective gave the image in the lower left corner, with the enlarged form is at the lower right. Note that each group of pixels from the original contributed to the reduced image in some way. Some groups became shades of gray. This new brush looks better in grays than in just black-and-white. It can also be "colorized" much better than the original, using the Tint color mode of *DeluxePaint III.*

You can antialias other objects besides brushes. You can antialias a straight line. Pick a brush about twice as wide as you want the final line to be. Move to the swap screen with the J key and then use the line tool to draw the line. Cut it out as a brush, jump back to the other screen, and use Do Perspective to reduce the size of the brush.

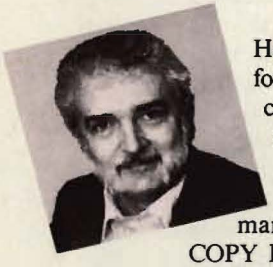
Figure 3 shows this in action. The leftmost line is drawn about twice as large as the line we eventually want to make. The next line to the right is an enlargement of this line. Notice the clear stairsteps. Next, much smaller, is the Do Perspective result. The next two lines to the right are enlargements of this line. In the final line on the right, note the extra gray pixels added along the sides.

Thanks to Steven Anzovin for supplying some of the tips in this article. More DeluxePaint *tips can be found in his book* Using DeluxePaint, *available from COMPUTE! Books. It was updated this spring to include information about* DeluxePaint III. ▲

CLI CLIPS

Jim Butterfield

Tips and Tricks



Here are some quick tips. It's easy to forget that names used in CLI commands can refer to either files, directories (drawers), *or* devices. This often-forgotten flexibility is easy to demonstrate with various combinations of the command COPY. Let's look at a few examples.

COPY DOG TO HOUND usually copies the contents of file DOG, creating a new file called HOUND that is an exact copy. That's true if DOG is a file and HOUND is either a file (to be replaced by the copied file) or nonexistent, in which case it will be created. If HOUND is a directory, however, the copied file is placed into the directory HOUND, just as if you had typed COPY DOG TO HOUND/DOG. And if DOG and HOUND are both directories, every file within directory DOG will be copied into directory HOUND.

If DOG is a text file, we can send it to the printer with COPY DOG TO PRT: or have it read to us on a 1.3 system with COPY DOG TO SPEAK:. It could be displayed on the screen with COPY DOG TO * (the asterisk represents the current console device—your CLI window).

Once you get used to the principle, you can give commands such as JOIN DOG CAT MOUSE AS PRT: and have all three files (DOG, CAT, and MOUSE) printed in one shot, one file following another. The relatively weak SORT command could present a small file in sorted order to the screen with something like SORT S:STARTUP-SEQUENCE *.

It's interesting to note that some commands seem to do the same thing. COPY DOG HOUND, where DOG is a file and HOUND does not exist, does exactly the same thing as JOIN DOG AS HOUND. Joining a single file simply transfers it to the destination. For that matter, TYPE DOG HOUND would achieve the same thing; it doesn't even matter whether file DOG is composed of readable characters. Each command acquires its own distinctive personality, of course, when specific command options are used such as COPY CLONE or TYPE HEX.

File redirection (using the > and < characters) can be useful. Suppose you take a directory of disk drive 0. You could send it to the printer with the command DIR >PRT: DF0:, or, if you wished to edit or further process this directory, you could sent it to a ramdisk file with DIR >RAM:DIRFILE DF0:. In many cases, LIST >DIRFILE DF0: QUICK might be more useful than DIR; pick what suits you. It seems to me that we are often in a rush to send things directly to the printer. Often we can do better by sending the data to the ramdisk so that we can dress it up with further editing, sorting, or processing before shooting it to the printer.

Verbose Startups. Tired of those long pauses during a startup or reboot? You can get your computer to give you progress reports very simply. Just look through the startup files (S:startup-sequence, or S:startupII if you're using system 1.3) and remove the >NIL: output redirection wherever you find it in a command.

Many commands are happy to report what they're doing. Remove the >NIL: phrase from SetPatch, FF, and SetClock and you'll get a lot of information. SetPatch tells you about the patches it is making, FF tells you who wrote this command and its version number, and SetClock gives you the time and date. These messages are always generated but are usually dead-ended to NIL:—nowhere. Free them and you'll have something to read while you wait. Use your favorite editor (say, ED), and be sure you do this work on a copy of your Workbench disk, not the original.

If you remove the >NIL: phrase from the WAIT command on a Workbench 1.3 startup file, you may be surprised to see a BREAK signal reported. This signal is transmitted between the two startup sequences. Don't bother modifying the ENDCLI >NIL: line at the end of the file; this command gives no output.

You can, of course, produce extra progress reports by inserting ECHO commands in the startup-sequence. Some new Amiga owners go a step further, using the SAY command to get the computer to shout out what it's doing. But using speech synthesis calls for memory and wastes time; the SAY commands are usually retired after a week or two.

New Developments. A recent developer's conference spent a lot of time chatting about ideas for the future Workbench 1.4 system. You'll probably hear a lot of the gossip, and much of it sounds exciting. Keep in mind, however, that many 1.4 features are only ideas at this point and that you won't see a release of Workbench 1.4 until 1990.

Two releases are available now. They are Workbench 1.3.1 and ARP 1.3. Although no final release has been made of either one at the time of this writing, each is undergoing early distribution.

• • •

While rumors fly about new system 1.4, Workbench 1.3.1 and ARP 1.3 are already available.

• • •

Workbench 1.3.1 is a minor upgrade of 1.3; it's a revision rather than a significant change. Nineteen key files have been changed in the new release. The changes are small, and you probably won't spot any difference in the way these commands or files operate. The 1.3.1 system is now being shipped with some new Amigas. If you have Workbench 1.3 but would like the revisions, you could probably get these files from a new owner. The table in the middle of this page provides a list of the significant files that have been changed in the newer 1.3.1 system.

ARP System. ARP, the AmigaDOS Resource Project, consists of rewritten CLI commands and new support features. ARP was produced by a private (non-Commodore) group. It's free, and the new version is compatible with the Commodore CLI system.

The ARP system may be installed on your Workbench disk (make a copy first!) by means of an installation program that asks simple questions and takes action according to your answers. You have the option of installing a full set of ARP commands or just the ones you want.

Should you switch and start using the ARP commands, which closely match the ones you know in CLI? User opinions differ. Those in favor argue that ARP is friendly, compact, and efficient. You'll save disk space and get new command flexibility. Those opposed to using ARP commands point out that they are not in the Amiga mainstream, so that you might have to back out when the 1.4 system finally arrives. ARP commands also tend to need more memory to execute, even though they take up less space on disk. My suggestion: At least try your hand at ARP and see how you like it.

Some ARP advantages are dramatic. For example, ARP's SORT works efficiently and cleanly, whereas the standard CLI SORT is slow and prone to system crashes. ARP syntax allows you to say such things as RENAME RAM:A* RAM:B*, which takes each file whose name starts with *A* and changes the first letter to *B*. Conventional CLI commands would need to use the script file DPAT to accomplish the same thing.

It's likely that Workbench 1.4 will adopt many of the ideas of the ARP system. At that time, we may see a blend that gives us the best of both worlds.

ARP 1.3 has been released with some preliminary documentation. User Groups may arrange to get the final release disk, when it's ready, by contacting AmigaDOS Resource Project, c/o Microsmiths, P.O. Box 561, Cambridge, Massachusetts 02140.

Keeping Up to Date: SYSCHECK. Most of us have quite a collection of disks of various sorts, with new ones arriving frequently. Although you may have carefully revised your standard Workbench disk to meet a recent standard, say 1.3, it's hard to be sure what may be on some of your new arrivals. Often these disks don't hint about the Workbench version they contain.

Enter SYSCHECK. I wrote this program to help me keep track of Workbench versions. SYSCHECK tells you if the files on your disk are 1.3, 1.3.1, or something else. The "something else" might be ARP or a 1.2 version of the file in question. SYSCHECK tells you when it doesn't recognize a file.

With SYSCHECK, you can check whether any disk contains the up-to-date operating system. If some of the files are not the current version, you'll know which ones to update.

SYSCHECK and its documentation may be found in the c directory of this issue's *Resource Disk*. To check a disk, use the command SYSCHECK *path*, where *path* can specify any drive such as DF0: or DF1: or directory. Without the *path* option, SYSCHECK checks the current directory.

Precautions. Whenever you receive a new disk, free or commercial, make a backup immediately and put the original disk away as an archive. Any changes or updates should be made to the copy. If the copy fails to work, the disk is probably copy-protected. In this case, dig out the original disk and mark it so you know that it's the only copy you have.

These days, there are various types of virus vandalism occurring. A user needs to be careful when a new disk arrives. Before putting an unknown disk into your Amiga, it's wise to first load a resident virus-detection program into the computer. The most popular is *VirusX*, by Steve Tibbett. Recent versions may be obtained from clubs or bulletin boards, or you can find a copy on Fred Fish disk #175. *VirusX* is also on the *Resource Disk* that accompanies this issue.

Alternatively, the New Orleans Computer Klub (N.O.C.K.) has put together a disk that is jammed full of virus-fighting programs and information files. The disk, called InNOCKulation, is freely distributed, so you may be able to obtain it from your local user group. If you prefer, copies may be obtained directly (at a nominal charge of $3.50) from N.O.C.K., 3701 Division Street, Suite 140, Metairie, Louisiana 70002.

Keep the write-protect tab open (protected) on all your boot disks. It not only helps protect against viruses, it also will guard against you doing something silly and harming the disk's contents. Even though nonboot data disks are fairly safe from virus attack, their contents could be harmed by a thoughtless command from the user (that's you!). If your data is important, back up those disks at frequent intervals.

A new type of virus, dubbed the IRQ virus, works in an unusual way. It attaches itself to one of your CLI commands. Recent versions of *VirusX* spot this one, too. You may also feel more secure by using SYSCHECK to ensure that your commands have not been tampered with. And remember that proper use of write-protect tabs can head off a lot of trouble before it happens. ▲

Updated 1.3.1 Files

c/DiskDoctor
c/Eval
c/FF
c/LoadWB
c/Mount
c/SetClock
c/SetPatch
devs/printer.device
devs/serial.device
l/Aux-Handler
l/FastFileSystem
l/Pipe-Handler
l/Speak-Handler
libs/version.library
system/DiskCopy
system/FastMemFirst
system/Format
system/NoFastMem
system/SetMap

trends

Viruses and Trojan Horses

Has your Amiga been acting a little out of sorts lately? It may have a virus.

For over a year, the computer press has been reporting computer viruses. A few Trojan Horses have even made the national news.

Despite all the warnings, many Amigas have succumbed to viruses. To date, there are well over 20 different Amiga viruses, each with its own approach to ruining your day. The two most notorious are the SCA virus (relatively benign) and the Byte Bandit (fairly destructive).

In the IBM and Macintosh communities, Trojan Horses (which attach themselves to common commands or programs) are by far the most numerous type of destructive programs. Amiga users should consider themselves lucky that there is only one Amiga Trojan Horse making the rounds: the improperly named IRQ Virus.

There are many ways to protect against these destructive culprits. See this issue's "Best of the Boards" for information about *VirusX*, a virus killer that can be found on the *Amiga Resource* companion disk.

There are at least three commercial programs which deal with the virus problem. See the list below.

Until you get one of these products to help you deal with viruses, follow these safe-computing tips:

- Set the write-protect tab of your Kickstart disk if you own an Amiga 1000.
- Add the following lines to your startup-sequence file:
  makedir ram:t
  assign t: ram:t
- Set the write-protect tab on your Workbench disk.
- Make frequent backups of your original program disks and make duplicates of all important data.

Amiga Virus Protection Toolbox
$59.95
Abacus
Dept. L7
5370 52nd St. SE
Grand Rapids, MI 49512

Anti-Virus
$39.95
DevWare
10474 Rancho Carmel Dr.
Rancho Bernardo, CA 92128

Virus Infection Protection
$49.95
Discovery Software
163 Conduit St.
Annapolis, MD 21401

—Scott Pinkus

And the Winner Is . . .

Spectrum HoloByte's *Tetris* came away with four of the 1988 SPA Excellence in Software Awards. *Tetris*, the addictive game from Russia, won Best Entertainment Program, Best Action/Strategy Program, Best Original Game Achievement, and the Critic's Choice Award for Best Consumer Program.

Other winners included Cinemaware's *The Three Stooges* for Best Sound Achievement in a Non-Music Product, Interplay's *Battle Chess* for Best Graphics Achievement in a Non-Graphics Product, and Bethesda Softworks' *Wayne Gretzky Hockey* for Best Sports program.

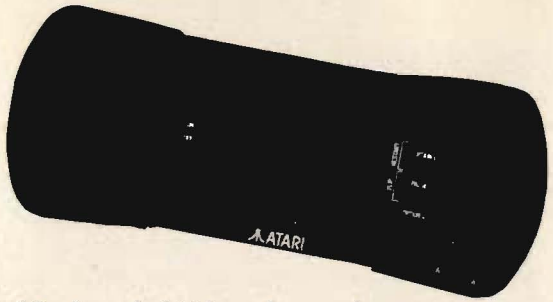
Into the Past

In summer, we discussed Commodore's development of a **low-end Amiga videogame system.** Well, it seems that the wizards of West Chester have abandoned that concept in favor of **a new 8-bit computer** system. Since they apparently can't reduce the cost of an Amiga enough to sell it in the $350 price range, they're looking at doing to the 64 what Apple did to the Apple II—turning it into a "64GS". This whiz would have 128K of RAM (expandable to a meg), a high-speed 65816 processor, a built-in 3.5-inch drive, and **a graphics chip that supports up to 256 colors onscreen** at once. And of course, the machine will have a 64-compatibility mode—just to make sure that nobody will write software for the enhanced modes.

While we sympathize with Commodore's desire to inject a little life into the low end of its business, we nonetheless see some flaws in its reasoning. No matter how you dress it up, 8-bits are old news. Even **Nintendo and Sega are going to 16-bit** game systems. Just who is Commodore trying to battle in the $350 price range? It's been there all by itself for quite some time. Moreover, who is going to write software for yet another low-end platform? We hear that the second tier of software houses, the ones who can't get a license from Nintendo, are all in favor of this new machine, while **established software companies couldn't care less** about it. **—S.L.**

Hot News and Insider Gossip by Sheldon "The Ear" Leemon

New Products edited by Mickey McLean



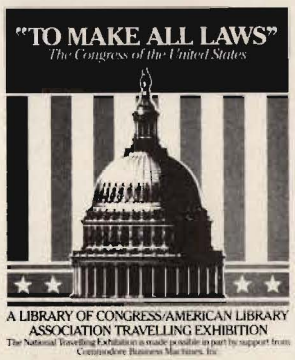
Life's Little Ironies

Last issue, we successfully predicted that the **secret Epyx game machine** would be a hand-held unit and further noted that the cost of bringing such a unit to market could be ruinous. Well, we were right on both counts. At the Summer CES show in Chicago, Epyx showed off a hand-held game machine with a 3-inch 160 × 100 pixel color LCD screen. The machine is said to have **a lot of graphics power,** with a 4-MHz 65C02 processor and custom graphics chips that provide sprites that not only move by themselves, but can be rotated automatically as well. It will also have an I/O **port for hooking together up to eight of the units** for multiplayer games.

In order to put some marketing muscle behind the machine, Epyx has **joined forces with Jack Tramiel's Atari Corp.,** which will manufacture and distribute it. This had to have been a somewhat bitter blow to Epyx president David Morse and his former Amiga employees. When the old Amiga corporation was running out of funds, they took out **a million-dollar loan** from Atari using their graphics chip technology as collateral. After Tramiel acquired Atari, however, Amiga quickly sold out to Commodore and paid off Atari, so as to keep the Amiga technology out of Tramiel's hands. Looks like they weren't quite so lucky this time.

The marriage between the two companies is bound to be a strange one. For one thing, the development system for the game machine is based on the Amiga 2000. Can you picture **Tramiel buying Amigas for Atari employees** to work on? When asked if Atari ST systems couldn't be used instead, Epyx employees reportedly responded, "Sure. If they can support graphics like this, and multitask, and use 68020's, and. . . ." —S.L.

Taking to the Road



Commodore has lent its support to a new traveling exhibit called "To Make All Laws: The Congress of the United States, 1789–1989." The cross-country tour, a joint project of the Library of Congress and the American Library Association, will make stops in 30 U.S. cities.

The exhibit, sponsored in part by a grant from Commodore, will feature Amigas as interactive video components. Visitors will be able to use the Amigas to access an audio/visual presentation of the history of the United States Congress as it celebrates its 200th anniversary.

Library of Congress, Washington, DC 20540

To Make All Laws Tour Schedule

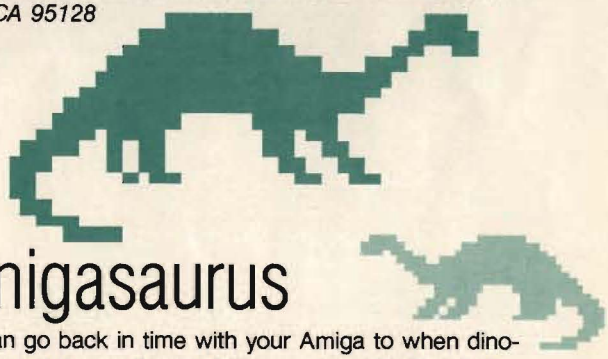
Dates	Exhibition Sites
Nov. 1–Nov. 28, 1989	St. Louis; Sacramento, CA; Denver
Dec. 13–Jan. 9, 1990	Los Angeles
Jan. 24–Feb. 20	Omaha, NE; Philadelphia; Boise, ID
Mar. 7–Apr. 3	Ft. Lauderdale, FL; Charleston, WV; Billings, MT
Apr. 18–May 15	Dallas; Rochester, NY; Rapid City, SD
May 30–June 26	Indianapolis; Boston; Oklahoma City
July 11–Aug. 7	Louisville, KY; Baltimore
Aug. 22–Sept. 18	Madison, WI; Portland, ME; Houston
Oct. 3–Oct.30	Chicago; New Orleans; Tucson, AZ
Nov. 14–Dec. 11	Atlanta; Detroit; Reno, NV
Jan. 7–Jan. 31, 1991	Olympia, WA; Cheyenne, WY; St. Paul, MN

Hit the Hardwoods

Accolade has recently released an Amiga version of its basketball simulation, *Fast Break.* This three-on-three, full-court game allows you to call your own offensive and defensive plays.

Two players can battle head-to-head or you can compete against the computer using a full repertoire of jump shots, slam dunks, and three-pointers. Select one guard, one forward, and one center from a roster of six candidates, each with different skills and talents. Then select four plays from a playbook or design your own with the Playmaker option. *Fast Break* has a suggested retail price of $44.95.

Accolade, 550 S. Winchester Blvd., Suite 200, San Jose, CA 95128



Amigasaurus

You can go back in time with your Amiga to when dinosaurs ruled the earth with *Dinowars* from DigiTek Software. This interactive strategy game features fully animated arcade sequences and an encyclopedia that includes interesting facts about the prehistoric era.

The game features eight varieties of dinosaurs that pair off into two opposing armies to fight over territory on a prehistoric battlefield. Two players can battle each other or you can take on the computer. The suggested retail price of *Dinowars* is $39.95.

DigiTek Software, 8910 Dale Mabry, Executive Center, Suite #37, Tampa, FL 33614

Amigas Weather the Storm

The largest private weather service in North America, Accu-Weather of State College, Pennsylvania, uses the Amiga to create weather maps and graphics for some of its subscribers. The company also has an Amiga Weather Graphics System available to television stations that allows them to receive broadcast-quality weather maps, forecasts, and weather data from Accu-Weather. Currently over 30 television stations use the service.

Dr. Joel Myers, founder of Accu-Weather, said that he selected the Amiga because of its adaptability to broadcast requirements and its reasonable price. Myers reported that the weather service can offer stations a way to transmit their graphics on the air for under $10,000, which is less than a third of the cost of other systems.

The Spirit of Conciliation

We recently received a press release from the ARP announcing the release of version 1.3 of ARP, a collection of improved CLI commands, an enhanced command shell, and a shared library of functions for programmers. The release stated that the initials *ARP* stand for ***AmigaDOS Resource Project.***

Funny, but as I remember it, when ARP was founded by Charlie Heath way back in 1986, it was called the *AmigaDOS Replacement Project,* a group dedicated to the complete and total overthrow of the world's slowest disk operating system. Charlie can afford to be conciliatory these days, however, since it appears that he has won the battle. Not only will the 1.4 version of **AmigaDOS be recoded in C** (replacing the BCPL portions of the operating system) and the **Fast File System** be installed as the default file handler, but some of the ARP library functions (such as a common file requester) will be included in a new standard system library.

When asked if the 1.4 changes fully realize the goals he set out to accomplish when he started ARP, Charlie replied, "That was so long ago, **I don't even remember.**" —S.L.

Good News, Bad News

Those who are familiar with the status of **Commodore's new high-end Amiga,** the 3000, all say that the machine is closer to completion than most people think. In fact, they say, production could start as early as the end of this year (translation: next spring).

The down side to this is that **the 3000 probably won't be a radical departure** from the 2000, but more like what the 2500 should have been: a native 68030 machine with more memory, a faster processor, and a 32-bit bus. As for **rumors of an enhanced 1024 × 1024 display** with millions of colors—in your dreams, sweetheart. As I keep telling anyone who will listen, the Amiga system software is so inextricably bound up with the current graphics hardware, it would take a complete rewrite to support a radically different display. About the best you can hope for here is an optional deinterlacer board, à la Flicker Fixer.

The most interesting thing about the 3000 may be its price. The feature list (and the current price tag of the 2500) make it likely that the price tag will be in the $5,000–$6,000 range. That would move the 3000 into **the same price class as the Mac IIx, Compaq 386, and even the NeXT** computer. This may be fully justified from the performance standpoint (since this machine will run about four times as fast as the 2500), but it still may be a tough sell, given Commodore's reputation in high-end markets. Maybe the company will be able to sell the 3000 as a low-cost **screaming-fast UNIX box** that just happens to run AmigaDOS on the side. —S.L.

Deluxe Help Is on Its Way

Two new interactive tutorial programs are now available from RGB Computer & Video Creations.

DeluxeHelp for DeluxePaint III, an interactive tutorial, includes tips, information, and demonstrations of the features of Electronic Arts' *DeluxePaint III.* Disk 1 explores the uses of *DeluxePaint III*'s painting tools to produce static graphics. Disk 2 covers animation including demonstrations of techniques used by professional animators. The two-disk package sells for $49.95.

RGB's first in a series of Advanced Techniques programs, *DeluxeHelp's Advanced Techniques—Textures & Backgrounds for DeluxePaint II,* may prove helpful to intermediate or advanced users of EA's *DeluxePaint II.* The program takes you through the process of creating organic textures and backgrounds used in television, advertising, and business presentations. Demonstrated textures include wood, marble, granite, gold, and smoke. Each of the 29 lessons creates a complete texture or background which can then be used as components of still images, foreground or background layers in animation sequences, or as texture maps for 3-D objects. The suggested retail price for *Textures & Backgrounds for DeluxePaint II* is $34.95.

RGB Computer & Video Creations, 3944 Florida Blvd., Suite 102, Palm Beach Gardens, FL 33410 ▲

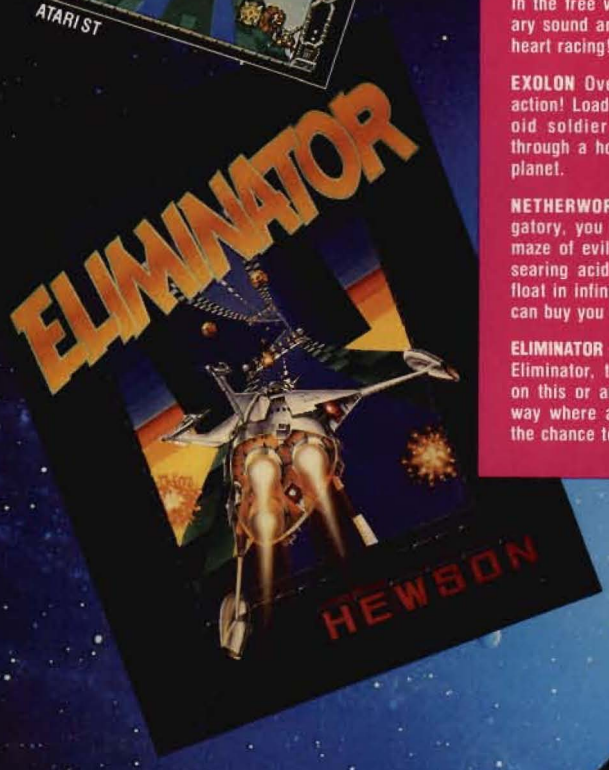
ONE MAN WIPED OUT EUROPE. NOW, HE'S HERE!

Andrew Hewson, arcade king of England, has just blasted his way across the Atlantic with three of the best space fantasy shoot-em-ups in the free world. Dazzling graphics, revolutionary sound and electrifying action will keep your heart racing!

EXOLON Over 100 screens of pulse-pounding action! Loaded with firepower, you're a humanoid soldier blasting and battling your way through a horde of aliens on an enemy-infested planet.

NETHERWORLD Trapped on the Planet Purgatory, you fight your way through an endless maze of evil demons and fantastic magic, skin-searing acid bubbles and tormented souls who float in infinity, searching for the only thing that can buy you freedom: diamonds.

ELIMINATOR You're at the helm of the warship Eliminator, the most powerful fighting machine on this or any world, hammering down a highway where aliens wait at every turn, eager for the chance to make this mission your last.



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LIVELY ARTS

GRAPHIC

Lee Noel, Jr.

The flag of Amiga art flies ever higher. This hands-on look at paint programs and graphics tools can help you add your own banner to the parade of Amiga artists.

A complete overview of current state of the art in Amiga art could easily fill a book. But you've got to draw the line somewhere. So, in this article, I'll cover only the computer equivalent of traditional two-dimensional visual art. This means that we'll be dealing with material that could be rendered conventionally on canvas, paper, or another flat surface (much like oil and watercolor paintings, etchings, drawings, montages, collages, and so forth) but which we prefer to bring to life on the Amiga's monitor.

We'll also concentrate on general topics and concepts that will help to provide the beginning Amiga artist with an overview of this exciting medium. To provide details and insights into specific tools and techniques, three noted artists have contributed accompanying articles which show them at work on various kinds of real Amiga art projects.

Cave Paintings

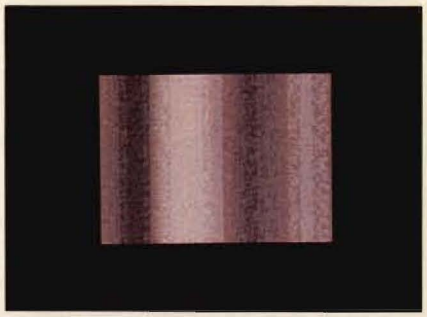
Once upon a time, things were clear and uncluttered in the world of Amiga graphics.

When the original version of the computer appeared (now called the 1000, but then known simply as the Amiga), artists had access to a maximum palette of 32 simultaneous onscreen colors and to a number of resolutions ranging from low (320 × 200 pixels)

Waving flag in background of front cover started with this basic flag image. . . .

to high (640 × 400 pixels).

Significantly, the higher resolutions were much finer than those that had been previously offered on popularly priced computers, and the total 4096-color range supported by Amigas seemed like a limitless rainbow. The Amiga's palette is the result of the computer's RGB (Red, Green, and Blue) method of creating a given screen color by mixing different intensities of the three basic colors of light. Each color may be adjusted over a 16-step range for a total range of 16 × 16 × 16 (that's 4096). Because each and every screen pixel in an Amiga graphic could be colored independently of its neighbors, and because a picture's palette could be constructed with colors from anywhere in the computer's paintbox, it wasn't long before impressive works of art began flowing from the machine in a torrent.



. . . Flag was then draped over this rectangle to add necessary shading. . . .

Well, at least everybody else was impressed. The pictures looked florid and lumpy to me. Worse still, the vast majority of these early works were in 32-color, low-resolution mode. Frankly, this left me sick at heart. Not only was the Amiga relatively expensive, but it was mainly being used to produce art at a resolution that the Commodore 64 could match. I know a 320 × 200 screen when I see one, and I was expecting a lot better from this grand, new, art-oriented computer.

Wavering Resolutions

Why weren't the higher resolutions in use, I wondered? A little—very little—experimentation quickly revealed why. The next-higher resolution, 640 × 200, produced horrible, vertically

. . . Final composite image, with background, was produced on *Photon Paint* 2.0.

elongated pixels, fine perhaps for creating El Greco–like graphics, but very limiting because a horizontal line was forced by simple geometry to be about three times the width of a vertical one. Essentially, this meant forgetting all but the most specialized line work in this mode.

Much nicer pixels—closer to the classic golden rectangle proportions—were produced by moving a step up the Amiga's resolution ladder, but the price paid to see them was too steep for me. This was interlace mode, 320 × 400 resolution, and had clearly been designed with a view to one of

Hermann Hesse's novels, *Steppenwolf.* In that book there is a rather unusual show, with a rather unusual entrance fee. Outside, the sign reads, "Price of admission, your mind." This, literally, was the cost to me of using interlace. Working under this mode's frantic jittering, it is possible to develop a 9.0-Richter-scale headache without assistance from illness or cranial trauma. Unlike the man-beast Steppenwolf, this was a price I was not prepared to pay.

The Amiga's top resolution, 640 × 400, turned out to be another interlace mode and was memory-hungry, to boot. Offering reduced color possibilities and enough eyestrain to detach even the most securely anchored retina, this mode transformed the Amiga screen into a vibrating panel on which artwork generally resembled disjointed webs constructed by badly agitated spiders.

With my disappointing survey of the Amiga's graphics modes complete, I relegated it (in my own mind, at least) to being a machine good for games, but absolutely unsuitable for serious artistic endeavor.

HAM Enters the Picture

Naturally, it was only a few weeks later (actually, I have no clear recollection of the timing—Yours sincerely, R. Reagan) that I was joyfully using the Amiga to produce art of all kinds. My unthinkable conversion had been accomplished by the appearance of programs making use of the Amiga's mysterious hold-and-modify (HAM) mode. That HAM enabled the Amiga to play a meatier role in art and graphics only served to reconfirm my belief in an ironic basis for all existence.

HAM smashes through the 32-color-palette barrier, establishing a display in which all of the computer's 4096 colors can appear onscreen at the same time, subject to some limitations. This mode is difficult to program and difficult to understand, and, according to one of those apocryphal Amiga development stories, there was time when the designers considered dropping it from the machine altogether. Fortunately, they didn't, but it seems to have taken additional time for software developers to master and apply this complex display configuration.

In simple terms, here's how HAM works. A palette of 16 basic colors is set up for a given screen. The RGB values for these colors form the foundation on which HAM will build the rest of the colors to be included in the picture. Depending on the color requirements of the art or digitizing progam in use, an individual pixel may be colored directly by one of the 16 palette colors or—much more likely—the pixel will be colored by calculation according to the dictates of HAM mode. In the latter case, a target color is chosen for the pixel, and the program tries to meet that value. This it does by examining the pixel to the left of the one to be colored. Under HAM, the software then has the option of *holding* two of the RGB settings that determine the color of the left-hand pixel and simultaneously *modifying* one of them. This adjusted RGB set is then used to color the right-hand pixel.

continued on page 33 ▷

Profile of an Artist
RICHARD NICHOL

Imagination and the Amiga have always gone hand in hand, and ray-tracing programs provide the tools to dramatically project your imagination onto the screen.

"Art Museum" and "Grecian Landscape" were both generated with *Turbo Silver* 3.0 and touched up with *Deluxe PhotoLab*. I created objects with *Modeller 3D,* converted them to the correct format with *Interchange,* and imported them into *Turbo Silver* for rendering. In "Art Museum," the picture frames and marble wall were digitized using Framegrabber and then brush-mapped along with the paintings into the scene. The reflective floor brings a touch of realism to the picture.

In "Grecian Landscape," the Greek statue was digitized and mapped onto a similar-shaped stencil. I created the mountains in the distance with Impulse's *Terrain Generator* and mapped them with digitized marble. *Turbo Silver* provides an almost unlimited flexibility in setting surface characteristics, and, in the case of the water, it took about 30 renderings to get the combination of transparency, refraction, and reflection that I wanted.

The ideas for my work come from magazines and history books. I start with a theme, say Japanese art or Roman architecture, and then determine the types of objects that could be created to represent that theme. In addition, I look for pictures that I can digitize to add the type of realism that 3-D rendering alone can't provide.

Using the Amiga as an artist's tool allows me to move objects around in 3-D space and experiment with different viewing angles, depth of field, and lighting in order to achieve a balanced picture composition. This is an enormous benefit compared with the traditional tools available to the artist.

Another key element in producing visually impressive ray tracings is a generous use of reflective or glossy surfaces. It's here that the mathematical calculations of ray tracing transform your picture into something magical and add the photorealism that can be so spectacular.

In the end, the long hours for both you and your Amiga will pay off in the form of stunning artwork.

Art Museum

Grecian Landscape

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Profile of an Artist
BILL MELENDEZ

Painting pictures on the Amiga is an experience similar to rendering watercolors or even oil paintings. Each method requires that I select a palette prior to starting the actual picture. The colors used are determined to an extent by the subject matter I choose to paint. To make things simpler, I use preexisting palettes that favor the mood I want to express. By doing this, I eliminate wasting time or having the colors in the wrong place on the palette.

I choose the subject, as in the case of the Peruvian girl, based on how challenging the picture is and the amount of appeal the subject has for me. I also imagine what the subject would look like if placed in a painting. Planning on composition, colors, and the amount of detail desired helps me avoid a project that's beyond the capability of the Amiga.

"Peru Ad" started as a series of magazine pictures from my picture files. The little girl struck me as an ideal subject. The pose, look, and innocence seemed ideal for video art. With all the pictures, I did preliminary line drawings and combined them into a montage. This was done by tracing the drawings onto the computer with the Easyl drawing tablet and *DeluxePaint II*. Each line drawing is moved around as a brush and then stamped down onto the montage.

With the drawing completed, the process of adding color begins. In the hi-res mode of *DeluxePaint* (640 × 400), the palette is limited to 16 colors. With imagination and crosshatched patterns, I can increase the amount of colors available on the screen. Both "Peru Ad" and "Fish" use a checkerboard-pattern technique to expand the number of perceived colors. This approach is similar to that used by magazines in printing color pictures.

The method I use for adding color to a line drawing is a color-by-numbers approach. Using the fill tool in *DeluxePaint*, I fill in the main colors needed and then the shadows. Between the main colors and the shadows, I stamp down checkerboard patterns. The brush allows the main colors to show through alternating pixels. Normally the patterned brush uses a color lighter than the one it is being stamped upon. I employ the rubber-band tool to further expand the intrusion of lighter shades into the darker shadows of the painting.

To get additional colors, I lay single-pixel diagonal lines in sequence along the edge of a major color area. I alternate the colors as each rubberband line is clicked into place. This process is slow, but the results are interesting.

Both pictures were done as part of a demo to help local dealers sell Amigas. The demo has additional hi-res art, all of which were combined into a slide show with *Lights! Camera! Action!*. The demo is distributed by our local Amiga user group, the Augusta Area Amiga Associates, to promote the group and the Amiga.

Peru Ad

Fish

Profile of an Artist
KEVIN LUDE

As a painter, I have found great satisfaction in replacing traditional materials with the paint programs on the Amiga. A fine artist working on canvas strives to simulate light; whereas a computer artist paints directly with light. The Amiga offers the home user access to a palette of thousands of colors, precise graphics tools, and fantastic special effects. I work with these tools to create new mixtures of style and content, and strive to push limits in visual sensation.

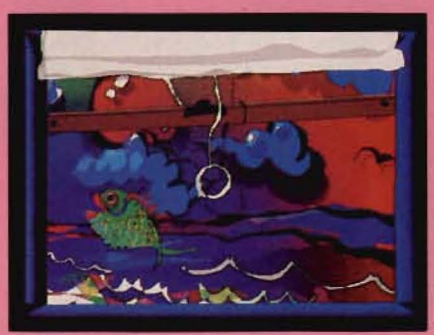
The paintings "War Morning" and "Picture Window" were both produced using NewTek's *Digi-Paint*. "War Morning" was the fourth picture I made on the Amiga. It won a first-place award over other works made on $10,000 machines. The painting is a commentary on the survival of the human spirit.

I made the background on "War Morning" by using Tint mode with Fill on. I then rolled the mouse around in quick, random figure eights with blues and greens. Black was added at the top in repeated washes to make receding hills and atmosphere. I made the face sphere with a solid circle; then I employed *Digi-Paint*'s Again tool with shading. Bits of color from other parts of the picture were dropped in to unify the face with the rest of the picture. I drew the hair with rapid strokes of a line tool and then drew a halo with a tinted circle. The bird and fence were drawn with a fast freehand to give a playful feeling.

"Picture Window" is a fanciful abstraction of a view from a seaside cottage window. The painting has a background composed of dithered hues of primary colors. Most of the rest of the picture was made with flat, solid shapes, but some of the waves utilize the XOR function. I added shadows as dark tints under shapes. The flatness and front lighting combine to lend the picture a style reminiscent of an old shadow box.

If you'd like to receive two "Hamshows" of these and other works, a newsletter, and an Amiga Artist's Club membership, send $5 to Kevin Lude, 4401 Devil's Road, Pemberville, Ohio 43450.

War Morning



Picture Window

A Calculated Effect

In a way, it's as if HAM offers a full set of RGB sliders for every pixel on the screen. Two of the three sliders must match those coloring the pixel on the left, but one is completely independent. This is why, in an often-quoted example, it takes four HAM pixels to go from black to white.

In practice, black and white are often included in the basic 16-color palette for HAM pictures. The palette is exempt from the HAM rules, so black and white frequently lie adjacent to each other in HAM pictures.

Clearly, however, the locked slider effect in HAM means a lot of work for the programs that operate in this mode. HAM screens are produced as the result of a running series of rapid calculations. Every time a color is added or removed, the target colors in a particular area change, and HAM software must recalculate RGB settings that not only attempt to accommodate the new target values but also leave the existing screen details fairly stable.

Although it's something of a morass technically, HAM can produce pictures that are very pleasing even to this jaded observer's eye (a typical odd detail: the 16 colors in the basic HAM palette might be white through black, with the intervening colors being the computer's 14 possible grays; this palette could be used to produce certain full-color pictures in which none of the base colors would appear). A 320 × 200 resolution HAM picture has the appearance of a sort of slightly blocky TV-quality image. The 320 × 400 resolution HAM pictures are really quite close to TV standard, although this is one of the dreaded interlace resolutions.

Why these references to television? The answer is simple: This omnipresent medium has put millions of CRT screens into millions of homes for decades. What better way to gauge images on computer screens than to measure them against this familiar yardstick? Current TV standards are not high-resolution, but with the ability to reproduce virtually any color in any pixel, they can offer visually acceptable images of all but the tiniest details. In the same way, HAM's additional colors enable the Amiga to transcend its inherent resolution by approximating detail with color manipulation. Like TV, the Amiga with HAM can display quasi-photographic images. One of HAM's first major appearances was in NewTek's classic video digitizer, Digi-View, which made (and continues to make) very nice, photolike Amiga displays out of anything at which a video camera can be pointed.

In attaining near-TV quality, HAM mode expands the range of Amiga graphics into a more mature realm, where the screen equivalents of traditional effects like washes and airbrushing are, at last, more than just empty terms used in program documentation. And, since HAM is still a relatively unexplored phenomenon, it's probably a safe bet that more and more will be done to improve the quality of the young medium.

HAM mode can produce pictures pleasing even to this jaded observer's eye.

Neither Here nor There

A brief mention should be made of the Amiga's remaining display mode, Extra Half-Brite. Here, the computer can display up to 64 screen colors simultaneously. Unfortunately, 32 of these colors are just half-intensity versions of the colors established in the 32 regular-color registers. If you change the color in one of the main registers, the associated half-brite color changes, too. This mode is regarded as a swell way to produce shadows. To me, it's an unsatisfactory approximation of HAM. It also is not supported by the hardware on some of the older Amiga 1000s, so it's a mode that should be approached with caution.

Quo Vadis?

The starting Amiga artist is faced with some questions: What resolution to work in? How many colors to use? Is interlace really so bad? Is HAM really so great? Again, it's the Amiga's versatility that forces these questions, but for artists these questions represent a delightfully fluid medium of expression. However, the way an artist chooses to answer them tends to fix some choices. Naturally, on the Amiga, those answers are implicit in the artist's choice of graphics software. If you want to work in HAM, but you have a 32-color program, you're just plain out of luck. Obviously, software is the key to art on the Amiga.

Since selecting the right program is especially crucial in the visual art arena, here's a survey of some products that are well-established in the field. In this context, I'm keeping squarely in mind Wilson Lee's letter in the premiere issue of *Amiga Resource*. Regarding painting programs, he asks, "Could you help me in picking an Amiga paint program that's complete, not aimed solely at professional users, and reasonably priced?" I hope we can help.

The toolbox we've selected consists of five paint programs and two image-processing packages. This latter pair of programs not only helps artists enhance and modify their work in various, nearly magical, ways, they also provide a gateway through which modes and resolutions can travel as they're transformed from one configuration to another.

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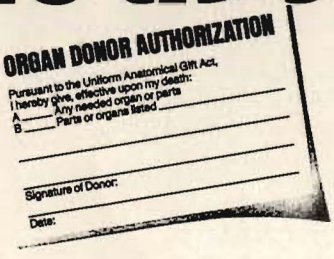

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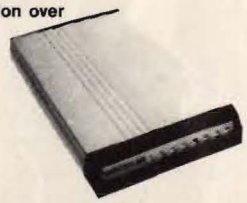

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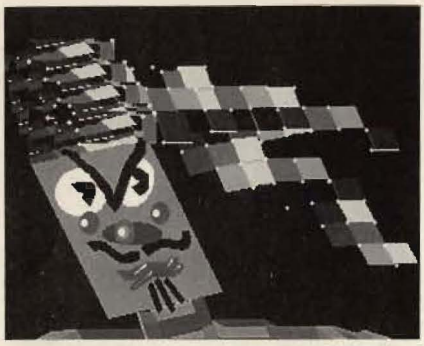
program, however, there are three factors to consider. First, *Images* offers access to only two resolutions, 320 × 200 and 640 × 200, thus supporting neither interlace mode. HAM and Extra Half-Brite painting aren't included, either. Finally, *Images'* user interface and some of the concepts it incorporates are decidedly different from those found in mainstream Amiga applications. (Depending on your sensibilities, this may not be a bad thing.)



Created with *Aegis Images* in 320 × 200 resolution with 32 colors, this design makes extensive use of the program's unusual ability to combine cycled color fills with automatically connected parallelograms.

In addition to a generous selection of typical drawing and painting tools, *Images* excels at the creation of various kinds of geometric figures. Through its Shape menu, the program actually offers specialized submenus of options that can be used by the artist to set different categories of intersection and edge-sharing for any or all of a certain type of figure.

Another nice touch in this program is the Fast menu. This small, movable menu offers easy access to the full palette and the four most recently used color fill patterns. By expanding the Fast menu, artists can just as easily select Undo, Options, one of the three most recently used brushes, or one of the three most recently used tools. The Fast menu provides convenience without clutter and is a real benefit to those who prefer to see most of the screen they're working on.

There is an easy-to-use pattern editor for making fills, too. Even though such editors often seem to be regarded as outmoded these days, I think they're excellent for decorative work with borders or small, repeating elements.

The program's method for Cut, Copy, and Paste centers on the unusual Frame device. Any screen segment captured within the Frame border can also be used as a brush, resized by dragging the Frame margin, or rotated with great speed.

Although *Images* contains many features for subtle blending and shading, its forte is probably angular work incorporating repeated motifs. This is a fun package to learn and to work with. Its peculiar user interface will not prepare you for the more standardized format found in most of the other paint programs, but I think the *Images* interface may actually be more intuitive and art-oriented for many people.

Digi-Paint

Digi-Paint was the original HAM painting program, and it's a personal favorite. Often regarded as a stripped-down and basic complementary art editor for Digi-View, the original program had a clean simplicity that tended to overshadow its considerable power. I consider *Digi-Paint* to be a nearly ideal paint program.

In addition to HAM equivalents of the usual tools and brushes, *Digi-Paint* also provides HAM fills and blends that are the smoothest around. Disguised as a simple Repeat button, the program offers the artist the ability to Undo an action and then repeat it exactly, after numerous options and settings have been changed. This may not sound like much, but in conjunction with the software's precise controls, it permits work of the subtlest nature.

This is the program to use for the equivalent of fine watercolors or delicate airbrush work. With it, you can get anything from the effect of sunlight through stained glass to the color of a night sky of perfect indigo seen long ago but never fogotten. On a less mawkish note, I find this to be the supreme program for manipulating camera-digitized HAM pictures. Others doubtless will not concur, but *Digi-Paint's* magnify mode offers the surest manual control I've found for pixel-by-pixel editing of HAM.

A powerful new version of the program, *Digi-Paint III,* will probably be available by the time you're reading this. It appears that the program will incorporate some new features, including much-improved menus and graphics controls. Even without seeing it, *Digi-Paint III* is the HAM program I'd buy. Every artist has individual sensibilities. It's important to try to find software that matches yours, so read on!

Deluxe PhotoLab

Deluxe PhotoLab consists of three components, Paint, Colors, and Posters. At this point, we're concerned only with the first of these, but the other two are useful adjuncts, allowing the products of Paint to be

The Toolbox

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Aegis Images
Aegis Development
2115 Pico Blvd.
Santa Monica, CA 90405
$39.95

DeluxePaint III

Deluxe PhotoLab
Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
$149.00 each

Digi-Paint
NewTek
115 W. Crane
Suite B3
Topeka, KS 66603
$99.95

***Photon Paint* 2.0**
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P.O. Box 3475
Granada Hills, CA 91344
$149.95

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Butcher
Eagle Tree Software
P.O. Box 164
Hopewell, VA 23860
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PIXmate
Progressive Peripherals & Software
464 Kalamath St.
Denver, CO 80204
$69.95

The paint programs selected all provide a reasonable level of performance, and they all contain the now-standard tools for drawing lines, curves, and filled and unfilled rectangles, ellipses, and various polygons. For detail work, all include a smoothly implemented system for zooming into a small area at high magnification. In addition, each of these packages provides a wide range of fills, blends, brushes, and painting effects.

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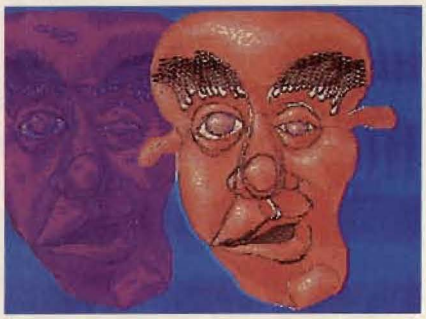
manipulated and processed and then printed to various machines.

This is an important package, and I'm not sure it has received the recognition it deserves. *PhotoLab* Paint is the only software that gives artists access to all the Amiga's graphics modes from a single program. Not only are all the modes accessible, you can work on them simultaneously. Each resolution/mode appears in its own window, and you can transfer elements back and forth between the windows with ease.



Created with *Deluxe PhotoLab* Paint in 320 × 200 HAM mode (4096 colors).

PhotoLab Paint is a full-featured art program no matter what mode it's working in. Special highlights are its many painting and shading modes, including logical operations (ANDing, ORing, and so forth, which can be used to mix and modify screen elements in many creative and helpful ways), that are particularly useful since this program includes its own version of *Digi-Paint*'s Repeat function. One unique feature is the ability to create, test, and maintain numerous extra colors in a Paint set in the palette window. These additional colors are independent of the screen(s) controlled by the palette. Thus, they can be tested without fear of disturbing completed work. Successful Paint-set colors can be directly applied to HAM pictures; non-HAM work is colored with the normal palette color that is closest to the Paint-set selection.

For artists who want access to all the Amiga graphics modes but don't want to learn several programs, this is the only choice. *Deluxe PhotoLab* contains so much that its substantial price tag is actually a bargain. (By the way, some of Paint's features and documentation parallel its Electronic Arts' stablemate *DeluxePaint III.* This may be useful for artists who want to use both programs.)

DeluxePaint III

Rhett Anderson reviewed this new version of the old standby in the Fall 1989 issue of *Amiga Resource.* He states, "In my opinion, it's the greatest microcomputer program ever written."

I, Curmudgeon, would have to disagree. I've disliked every incarnation of this software and can find no reason to make an exception for the latest. Let me explain, but remember that my opinions are colored by personal tastes in software and artwork. Almost everybody in the universe agrees with the hyperbolic Anderson.

Not only does *DeluxePaint III* not work in HAM, but its user interface is downright gruesome. Some of the tool-selection icons give very poor visual clues to the tools they represent. The Brush Selector icon is the worst of the lot, but it depicts one of the program's most important features. And even Anderson admits that *DPaint III* is not well-suited to use on a 512K machine.

To be honest, the program is loaded with every imaginable tool and feature. *Bloated* might be a word more apt than *loaded;* this software really is packed. As a consequence, it has the steepest learning curve of any of the packages discussed here. Windows, gadgets, and requesters lie many layers deep, and a lot of them utilize unfathomable jargon and symbolism. But once an artist begins to dig deeply into this structure, the rewards more than compensate for the effort.

Since *DeluxePaint III* contains every known brush, drawing, painting, shape, and masking tool, there's little point in listing them individually. Most of these features are more or less identical to those found in *DeluxePaint II,* anyway. Much of the impetus for *DPaint III* was creator Dan Silva's desire to add animation to the package. As usual, he has succeeded with a vengeance.

There are three different ways to animate graphic creations. These can be saved and played back, of course. There's even a stand-alone application you can put on your animation disks so that anyone with access to an Amiga can watch your creations come to life and dance across the pixels.

If you like non-HAM Amiga art and want the most complete program around, and if you'd like to try your hand at a well-implemented animation system (no HAM, don't forget!), *DeluxePaint III* has it all.

Photon Paint 2.0

This is another great HAM program, and a fairly recent upgrade of the original *Photon Paint.* In some ways, this program offers the same level off complexity as *DeluxePaint III,* but its interface is more easily understood. In this regard, I must add a strong vote of appreciation for Don Bluth alumna Heidi Turnipseed's wonderful program documentation. She always writes for the artist, not for the computer-fixated. Her notes are thorough enough to enlighten the most nervous newcomer, and her tutorials are well developed and offer clear insights into the methodology of a working artist.

Once again, this is software with too many features to list. To give you just a taste of the depth of *Photon Paint II,* I'll describe one of its most engrossing features. Just as all these other painting packages, this one has the ability to capture a section of the screen and use it as a brush. Once captured, all can perform brush modifications such as flipping and rotation. *Photon Paint II* transcends these simpler functions by allowing brushes to be wrapped onto objects. Of course, they only look as though they're wrapped onto objects, but the program provides enough control of imaginary light sources to render some very realistic images. Some brush/objects are built-in: cones, cubes, tubes, and so forth. These are easy to use and form a good training ground for learning to

Created with *Photon Paint II* in 320 × 200 HAM mode (4096 colors), these *objets d'art* are just a single, roughly done brush of an eye wrapped on some default shapes. The background is a one-color fill given texture with the program's immaculate shading controls.

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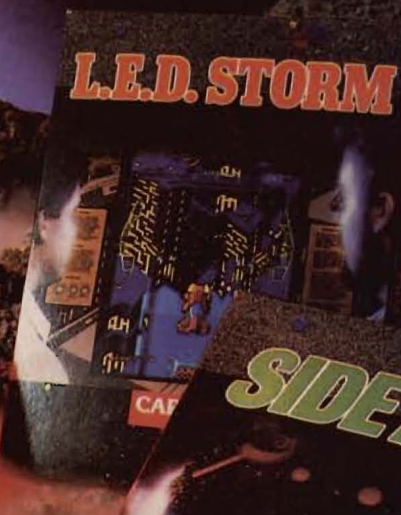

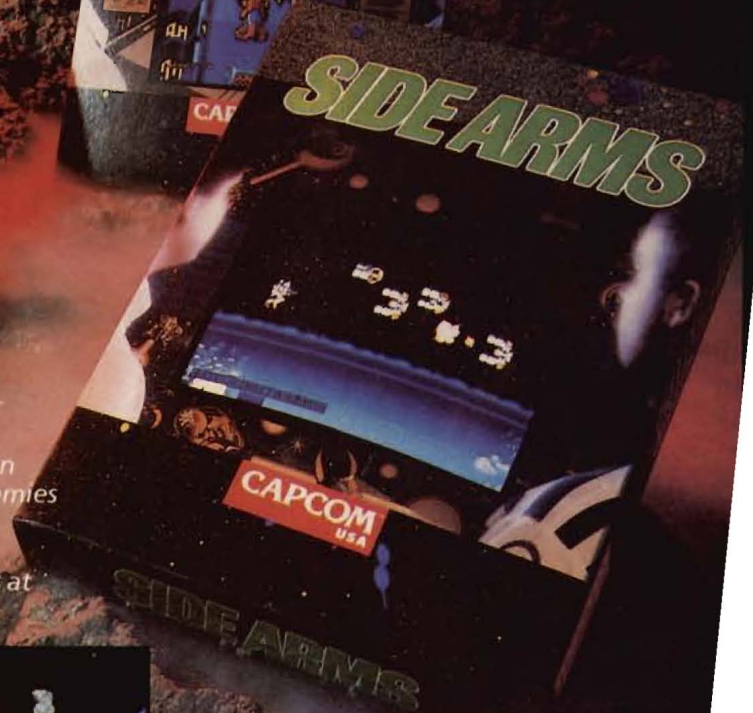

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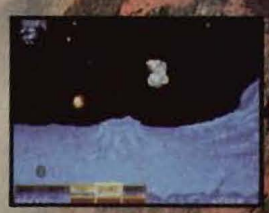

Side Arms Screen Shot.

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adjust illumination and other factors that affect brush wrapping.

Once simple brush mapping is mastered, many artists will become immersed in the more complex wrapping of brushes onto user-definable objects. *Photon Paint* offers enough features here to qualify it as a simple but effective ray-tracing program. In essence, this means that the computer is able to bounce rays from imaginary light sources off artist-specified objects. The process occurs in the mind's eye of the computer, but the end result is displayed on the monitor.

If you do try to use the program to do brush wrapping on a contour map, you'll find that one stage of the procedure allows you to tilt your brush in imaginary perspective. (*Deluxe Paint III* also incorporates a perspective brush feature, of course!) Try these settings (or ones close to them) when you experiment: Pitch = −17, Roll = 0, and Yaw = 34. This will produce an easy-to-comprehend three-quarter view when you preview the program-generated wireframe version of your contour map. This is a good reference point for further modification.

Created with *Photon Paint II* in 320 × 400 HAM mode (4096 colors), these rugged peaks were made by wrapping a plain yellow brush onto the varied gray rectangle shown below the mountains. Differences in intensity across the gray area become apparent differences in altitude in the wrapped brush. Lighting was arranged to fall on the peaks from the right.

Photon Paint II also includes a powerful animation package which is typically well-explained in one of the tutorials.

This is a great program for doing all but the most delicate work in HAM. I spent so much time with it that I wasn't able to devote the same level of attention to some of the other software. It's addictive and a bargain at any price.

Image-Processing Programs

Image-processing packages form an adjunct to the paint programs, and they represent one of the great strengths of computerized art: They perform functions that would be sheer magic in conventional media. With them, the computer artist can, for example, achieve the equivalent of turning a watercolor painting into a precise pointillist oil (HAM converted to 32-color mode), or putting an outline on already finished artwork (various edge manipulations), or recoloring an image into a negative version of itself (often an option called *negative*).

Colors in *Deluxe PhotoLab* is such a program, but the two below are well-regarded standards. There are considerable similarities between them, so you may wish to buy only one. This type of package is essential to fully exploit the Amiga as an art machine. Get one and experiment with it even if you're not quite sure what it does. You'll quickly begin to appreciate the power it wields.

PIXmate

This program converts an Amiga screen from any mode into any other. It also adjusts and analyzes palettes, offers various edge effects, can resize images, and has an array of image-processing options so extensive that I've not explored even a tenth of them. I use the program mostly to create masks for precise blending of complex digitized objects with heavily detailed backgrounds.

Here's how it works. The digitized image (HAM) is loaded and converted by *PIXmate* to 32-color mode. I next use the program to sort and reduce the number of colors in the image. By moving colors around in the now much-smaller palette, it's possible to quickly create a positive or negative masking screen that can take advantage of the transparency of Amiga's color 0. This mask is then loaded into a paint program, where its transparent areas are used to capture the matching areas of the screen while the remainder of the picture disappears under an opaque color.

PIXmate's edge enhancing effects make for interesting images.

Butcher

Also a powerful conversion and color-manipulation program, *Butcher* trades off some image-processing power for tools that let the artist edit details in a picture. Additional features provide stunning videolike effects, enabling you to remake a picture in many creative ways.

The Brush Is in Your Hand

While any of these programs can serve as a vehicle for exploring a great deal of Amiga art territory, there are also many other applications available for specialized artistic endeavor. Some are devoted to the previously mentioned ray tracing, allowing users to develop two-dimensional images with the appearance of highlighted and shaded three-dimensional objects.

Other software is dedicated to animation, offering sophisticated effects to artists involved with creating the illusion of motion. Of course, the Amiga's use in a variety of video situations is well known, and a number of high-end applications are available to facilitate this work. The computer has also been caught up in the desktop publishing revolution, with topnotch PostScript output available from Gold Disk's *Professional Page* and a growing number of other programs.

The future for Amiga artists appears boundless. With the development of increasingly powerful and varied software, broad new territories will open up while established ones are refined and move to higher levels. Once you start down this road, there's no telling where you'll end up. The only certainty is that you'll find the trip worthwhile. ▲

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Amiga BASICs

Dale McBane

BASIC is the most popular microcomputer language ever designed. For more than a few years, it has tried to break out of its role as a beginner's language. Will it succeed on the Amiga?

BASIC, like most languages, was born out of necessity. In the early days of computing, computer time was hard to come by. The cost of using the computer far outweighed the cost of writing software. Programs were written separately, using card-punch machines, for example, and submitted for processing as batch jobs. The computer executed one job after another, executing each program in turn, reading each's input and generating output.

As computers became more commonplace and computer time became less expensive, systems designers sought better ways to use programmers' time. In the early 1960s, the first time-sharing system was implemented. When this first interactive operating system was developed, the commonly used languages were still geared toward batch use. Programmers working under this new operating system required a different type of language, a language that could interact with them to speed up the development of software. This new language needed to allow the programmer to test programs and make changes in realtime. BASIC was the first language to meet these requirements.

BASIC was designed to be a language for beginning programmers. It was intended to be easy to learn, but useful. Early BASIC was a streamlined language that was easy for new programmers to understand. For these reasons, it became the language of choice for most microcomputers. Today, it is the most widely used computer language in the world.

Amiga Basic

BASIC on the Amiga had a less-than-auspicious start in *ABasiC*. *ABasiC* was a barebones implementation of the language. It had none of the embellishments that programmers have come to expect from a modern version of BASIC. The editor was crude, the interface with the Amiga almost nonexistent, and it didn't support any of the Amiga's unique features. Fortunately for the Amiga community, *ABasiC* disappeared quickly when Amiga Basic was introduced.

Amiga Basic pushed *ABasiC* into the background by giving programmers what they wanted—access to the Amiga's features. It supports many of the Amiga's capabilities with built-in commands. Those that it doesn't support directly can be accessed through calls to the Amiga's software libraries. Although Amiga Basic is easy to learn and very capable, its price is what has led it to be used on more Amigas than any other language. Amiga Basic has been the only language shipped with the Amiga since 1985.

If Amiga Basic is included with every Amiga, how can a software developer hope to sell a new version of BASIC? The answer is simple. Although Amiga Basic is a wonderful implementation of the BASIC language, it's not perfect. One of its biggest flaws is its lack of speed. Amiga Basic's editor is infuriatingly slow. Sometimes it can take minutes to scroll through a file to find the line you're looking for. The editor also lacks many useful features that could make programming in BASIC easier. ▷

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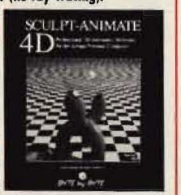

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If Amiga Basic's speed problems applied only to its editor, we could live with it. Unfortunately, they don't. Amiga Basic also executes programs very slowly; even the ancient *ABasiC* was faster.

Lack of speed isn't the only problem with Amiga Basic. It suffers from a problem inherent in the BASIC language itself. Amiga Basic doesn't support complex variables such as Modula-2's records or C's structures. On a machine like the Amiga, where the operating system uses structures extensively, this shortcoming can be crippling.

Another missing feature is the ability to have subprograms call themselves (subprograms that call themselves are said to be *recursive*). Without recursion, Amiga Basic can't be used to implement a whole class of algorithms.

The Others

There is room for improvement in the Amiga BASIC arena, and several contenders have come forward. I had hoped to include all the Amiga BASICs in this comparison, but I had to settle for the ones I could get my hands on. I'll compare *AC/BASIC* 1.3, *F-BASIC* 2.0, *GFA-BASIC* 3.0, *HiSoft BASIC Professional*, and *True BASIC* to each other and to Amiga Basic. I'll also discuss each BASIC individually, mentioning its strengths and weaknesses.

AC/BASIC and *HiSoft BASIC* each claim total compatibility with Amiga Basic. In addition to speeding up programs, both add features such as recursion and additional commands. *F-BASIC*, *GFA-BASIC*, and *True BASIC* are new languages that are quite different from Amiga Basic.

AC/BASIC, *F-BASIC*, *HiSoft BASIC*, and *True BASIC* are compilers. Each can generate independent, stand-alone code or code that requires runtime libraries to execute. *GFA-BASIC* is an interpreter.

GFA-BASIC, *HiSoft BASIC*, and *True BASIC* are integrated development environments. Each has an excellent built-in editor. *AC/BASIC* and *F-BASIC* demand that the user choose an editor.

All of these BASICs improve on Amiga Basic in one way or another. Each program is outstanding in some way, but each also has flaws. Whether they are worthy of spending the extra money for a new BASIC is up to you to decide.

Benchmarking BASICs

One issue that almost always stands out in the minds of programmers is speed. Programmers are notorious for pouring over code, trying to wring out everything they can from the machine. I'll admit that BASIC is not a language known for its speed, but some of these BASICs can hold their own against a good Modula-2 or C compiler. ▷

Table 1: The Benchmark Results (in Hours:Minutes:Seconds)

	Amiga Basic	AC/BASIC	F-BASIC	GFA-BASIC	HiSoft BASIC	True BASIC
Sieve	1:22/iter.	0:07/iter.	0:00.57/iter.	0:09/iter.	0:07/iter.	0:10.94/iter.
Graphics						
Load IFF	3:07.94	1:13.23	0:02.52(0:57.86)	2:00.45	1:04.76	*
Get and Put	5:34.70	1:51.56	1:02.80	1:29.05	1:49.25	*
Line Drawing	1:59.10	0:53.75	0:27.80	0:14.80	0:53.22	2:09.94
Integer Sort						
Quicksort	$	0:04.46	0:00.36	0:08.13(0:00.01)	0:06.61	0:07.88
Shell sort	05:09.86	0:26.00	0:02.36	0:54.99(0:00.02)	0:23.16	0:10.78
Heapsort	56:03.68	2:33.66	0:00.82	4:38.15	2:06.78	5:00.22
String Sort						
Quicksort	$	01:52.66	0:01.82	0:08.01(0:01.14)	00:18.90	0:08.18
Shell sort	0:05:24.30	08:02.10	0:10.36	0:55.23(0:01.16)	01:07.35	0:11.16
Heapsort	1:02:37.40	52:43.54	0:04.15	5:08.00	12:21.56	5:08.22
Matrix	1:11.88	0:10.52	0:02.72	0:17.0	0:08.42	0:11.64
Floating-point						
Basic Math						
Expected value: 10						
Single-precision						
time	8:05.60	1:30.64	0:54.58	#	1:19.55	%
value	10	10	9.9999999900	#	10	%
Double-precision						
time	10:13.88	2:06.60	3:02.72	1:47.00	2:47.73	1:11.24
value	10	10	10	10	10	10
Area under SIN(x)						
Expected value: 1						
Single-precision						
time	3:51.36	0:58.0	0:19.54	#	0:35.02	%
value	1.000106	0.9998854	0.9999949690	#	1.000106	%
Double-precision						
time	6:11.5	2:44.60	2:30.00	1:27.00	2:47.19	2:41.20
value	1.000000000004508	1.00000000000404	0.9999999998	0.9999999997976	1.000000000002094	1.0
Area under EXP(x)						
Expected value: 1.718281828 (e-1)						
Single-precision						
time	3:48.94	1:09.38	0:18.68	#	0:38.96	%
value	1.718231	1.717434	1.63846	#	1.718231	%
Double-precision						
time	5:23.54	2:49.02	2:32.00	1:25.00	2:44.63	2:55.64
value	1.7182819577210358	1.71828195770946	1.71792146453862	1.718281828586	1.718281957706658	1.71828

* True BASIC doesn't support direct access to the Amiga library routines. Therefore, the load-IFF portion of the graphics benchmark was omitted. (System calls can be written in C or assembly language and linked with the True BASIC program.) True BASIC also doesn't support bitmapped graphics, so the get and put portion was also omitted.
$ Amiga Basic doesn't support recursion, therefore, the quicksort routine was omitted.
# GFA-BASIC doesn't support single-precision floating-point numbers.
% True BASIC doesn't support single-precision floating-point numbers.

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☐ #90 **Modem Madness!** - Terminals include StarTerm, ATerm, and Kermit. Telecommunication utilities such as Archive are also here. Other types of programs and utilities are also included in the price of admission.

UTILITIES/APPLICATIONS

☐ #60 **AmigaBasic** - Two programs that are truly of commercial quality, Cell-Animate and Graphit. Some Deluxe Paint picture files are also included.
☐ #97 **Tutorial Disk1** - A disk full of information and programs to instruct Amiga Programmers and users. Several C & ASM source files are included.
☐ #98 **Tutorial Disk2** - More of the best of Amiga Information.
☐ #101 **Utilities** - Many new utilities like Timeset - a time setting utility and DirCopy-a great copier (very quick), and about a dozen more. Some new fonts are also included on this disk.
☐ #105 **Potpourri 1** - This disk contains several different kinds of programs, some of the highlights are: PopCLI2-evokes a new CLI window at the press of a button; PSound-sample sound recorder and editor; 3-D Breakout; DiskCat-catalogs and organizes disk files; IconMaker-makes icons for most programs so that they can run from Workbench; FKey-template maker.
☐ #129 **Amiga Utilities II** - A hard disk backup; Target-sounds a gunshot whenever the left mouse button is pressed; Dpaint Tutor; WinSize-change window size from CLI easily, and lots more.
☐ #132 **Videomaker Utilities** - This disk is packed with utilities to make your desktop videos easier to produce and more professional looking.
☐ #133 **DOS Helper** - A program designed to help you with the AmigaDOS commands. Can be activated from icon of the CLI. Supports multitasking, so that you can refer to it when you need it. As usual, there are other good programs included on the disk.
☐ #135 **Applications II** - Long Movie-plays several IFF pictures in fast succession, creating animation. QuickBase-a mail manager DBase. Persmail-a DataBase for keeping records of friends, family, associates, customers or employees. MORE.
☐ #146 **Calendar** - A very good personal calender for birthdays, holidays, meetings, bills and other events. Excellent graphics. Calendar program also has a diary. Other programs include some graphics and Checkbook.
☐ #150 **Textcraft+ Demo** - A demo of a very good word-processing program of high quality. Menu driven. Has a lot of helps to show you how. Textcraft+ also has a Speller Check available.

SOUND/MUSIC

☐ #18 **Future Sound Demo** - Another great sound demo of digitized sound. Includes the wicked witch of OZ, breaking dishes, sea gulls, car crash, ducks, others.
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☐ #1 **Norman Rockwell** - 17 beautiful digitized Rockwell paintings in this self-running slideshow presentation. You've got to see these!
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☐ #94 **Diga-View** - This one shows the digitizing process in stages. Several good pictures are included. Other programs also included.
☐ #95 **DigaSlide11** - Another in the great series of slideshows with great artwork. Self-running with over 25 pictures.
☐ #108B **Juggler** - Famous demo that shows the beautiful graphics of the Amiga and just how powerful this program is. It is easier to run than 108A, but only has the one demo on it.

GAMES

☐ #38 **Basic GrabBag2** - Around 25 programs of various types. Many of these are must-haves. At less than $.20 each, you can't go wrong!
☐ #44 **Games3** - More great games including Life, Vegas Slot Machine, Reversi, others.
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☐ #141 **Dominoes** - Dominoes game with great graphics. Also Tic Tac Toe, Drawing and Molecules programs.
☐ #147 **Jackland/Graphics** - Adventure clue game. Also some great pictures (graphics), a useful utility called Quickbase, and a fun program called Thingies which you will enjoy!!!
☐ #148 **Boulder Dash** - Very popular game with excellent graphics and has several challenging levels. This disk is full- It has Othello, Life3 and many useful utilities.
☐ #151 **4 in a Row** - A fun, but challenging game you play against the computer. There is an excellent Demo "MandFXP-D3", a utility or 2 and the fun TARGET - A weirdo thingy.

MISCELLANEOUS

☐ #88 **Amiga Basic Programs** - Over 50. Games, utilities, applications, entertainment, and finance. Also included is a program that allows you to use IFF files in your Amiga Basic programs.
☐ #119 **mCAD** - A full-featured computer-aided design program.
☐ #136 **Graphics2** - Border Set-useful for desktop publishing and video, making cards, coupons or menus, and your own artwork. Xicon-allows you to run AmigaDOS commands or programs from Icon.
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To judge the speeds of these versions of BASIC, I wrote a battery of benchmarks based on the BYTE benchmarks. The BYTE benchmarks are geared toward comparing processor speed, but I needed to test language speed. So I modified the benchmarks, where appropriate, to test the language instead. I used five basic benchmarks: sieve, graphics, sorting, matrix, and floating point. The times you see in Table 1 are the results of running the benchmarks on a stock three-megabyte Amiga 2000 with a 68000 microprocessor.

The Results

The sieve benchmark, taken directly from the June 1988 issue of *BYTE*, is designed to test how quickly the language can do integer math. It uses the Sieve of Eratosthenes method for finding prime numbers. The benchmark executes the sieve loop 50 times and displays the time as the average number of seconds per iteration.

Two of the BASICs turned in incredible times for the sieve. *F-BASIC* completed the benchmark in only 0.57 seconds per iteration. That's 12 times faster than the second-fastest time. *GFA-BASIC* finished in 9.0 seconds per iteration, only slightly behind the 7.0 seconds per iteration posted by *AC/BASIC* and *HiSoft BASIC*. This time is amazing only because *GFA-BASIC* is an interpreter and the other two are compilers.

The graphics benchmark consists of three parts. It loads a 32-color, 320 × 200 IFF file, animates a 20 × 20 shape from the picture, and then draws 10,000 random lines on the screen. The graphics benchmark, more so than the other benchmarks, uses the language's interface with the Amiga software libraries. The load-IFF portion of the program was designed to give you an idea of how long a common application might take with the language. You'll notice in Table 1 that the load times for the compiled languages were roughly equivalent. This can be attributed to the fact that the benchmark reads data from the disk. Input/Output is the great equalizer.

You'll also notice that there is a time in parentheses for *F-BASIC*. This value is the time it took *F-BASIC*'s built-in READIFF command to load the picture file. READIFF is a good general-purpose IFF reader, but it can be used only for ILBMs. If you need to load a picture into *F-BASIC*, READIFF is the way to go. If you need to load a non-ILBM IFF file, you'll have to write your own IFF reader.

I didn't implement the load-IFF portion of the graphics benchmark in *True BASIC* because the language doesn't directly support calls to the Amiga operating system. You can call routines from the Amiga's software libraries from *True BASIC*, but you must write the calls in either C or assembly language and then link those routines with your *True BASIC* program.

The second portion of the graphics benchmark uses Amiga Basic's GET and PUT commands (or the equivalent in the other languages) to move a shape around the screen. This part of the benchmark was designed to give you an idea of how well the language might handle animation. The benchmark stamps the shape onto the screen, erases it, and then moves to the next position. It repeats this process 10,000 times to get the results recorded in Table 1.

I didn't implement the get and put portion of the benchmark in *True BASIC* because *True BASIC* doesn't provide support for bitmapped graphics. I tried to simulate the GET and PUT commands using pictures, but the resulting program was so slow that I abandoned the effort. True BASIC is ideally suited for static displays, but animation should be left to a language better suited to the task.

Finally, the third portion of the graphics benchmark draws 10,000 random lines on the screen. Surprisingly, *GFA-BASIC* smokes all of the compilers in this benchmark. Its time is just over half that of *F-BASIC*, the second-place finisher. I can't explain why *GFA* is so much faster than the others in this benchmark.

The sort benchmark tests how quickly the language can do integer math and memory moves. It sorts 1000 random integers using the quicksort, Shell sort, and heapsort algorithms. For the sake of curiosity, I included a string-sort benchmark that sorts one thousand 20-character random strings using the same algorithms as the integer sort. In all the sorting applications, *F-BASIC* completes the benchmark well ahead of the other versions.

If you look at Table 1, you'll notice a strange anomaly in the *F-BASIC* sort times. For most applications, the Shell sort should finish well ahead of the heapsort. In the *F-BASIC* implementations, this was not the case. Both the integer and string *F-BASIC* heapsorts finished well ahead of the Shell sorts. Since all of the sort routines sorted the same random integers or strings, the anomaly can't be explained by the Shell sort encountering a worst-case situation. Even if this had been the problem, it's doubtful that both the integer and string sorts would have encountered a worst-case situation at the same time. After running the sort routines several times on several different sets of data, I couldn't find a solution to the problem.

Because Amiga Basic doesn't support recursion, I didn't implement the quicksort algorithm for either the integer or the string sort benchmark. I could have written a nonrecursive quicksort for Amiga Basic, but the nonrecursive implementation is inherently faster than the recursive implementation; if I had written one quicksort nonrecursively, I would have had to write all of them nonrecursively. Instead, I chose not to write an Amiga Basic version. (So I'm lazy.)

Looking at Table 1, you'll also notice times in parentheses beside the GFA quicksort and Shell sort benchmarks. These are the sort times using GFA's built-in sorting routines. These built-in commands are incredibly flexible and should be usable for most applications.

The matrix benchmark adds, transposes, and multiplies four random 20 × 20 matrices. I expected the *True BASIC* version of this benchmark to be much faster than the others because it has a full complement of commands for manipulating matrices. As you can see in Table 1, that was not the case. Again *F-BASIC* turns in the best time.

The floating-point benchmarks test the speed and accuracy of single- and double-precision floating-point operations. Like the sieve benchmark, they were taken directly from the June 1988 issue of *BYTE*. The floating-point benchmarks are divided into two portions: basic math and integration. In the basic math portion, the benchmark performs floating-point additions, subtractions, multiplications, and divisions 160,000 times each (a loop containing eight operations each of addition, subtraction, multiplication, and division is executed 20,000 times). All the BASICs calculated the expected value exactly, except for *F-BASIC*. In the single-precision benchmark, *F-BASIC* missed the mark by 10 millionths of a percent. *F-BASIC*'s single-precision

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floating-point routines are optimized for speed at the expense of accuracy. If you need fast-floating point operations and can live with a slight loss in accuracy, *F-BASIC* is the way to go. (It's a lot cheaper than buying a floating-point coprocessor.)

The second portion of the floating-point benchmark calculates the area under two functions using the trapezoidal rule integration method. As you would expect, the results from these tests vary more than they do in the basic math test.

Neither *GFA-BASIC* nor *True BASIC* support single-precision floating-point numbers, so only double-precision times are recorded for them. *F-BASIC* turns in the best times and has good accuracy for the SIN function. Strangely enough, it has the worst accuracy for the EXP function. *True BASIC* is the most accurate for the SIN function; *GFA*, for the EXP function. None of the BASICs are horrendously inaccurate, and only *F-BASIC* boasts great speed. Overall, they're pretty equally matched in the floating-point tests.

Program Size

BASIC compilers, in general, tend to generate large programs. The reason for this is that most BASIC compilers tack a runtime module onto each program. If you think about how most BASIC interpreters work, this practice will make sense. In interpreted BASICs, the interpreter itself serves as the runtime module. The runtime modules used by most BASIC compilers are little more than interpreters with the editor stripped away. If the compiler linked only the routines used by the program to the program code, compiled BASIC programs would be much smaller. As it is, C or Modula-2 programs that accomplish the same task as a given BASIC program tend to be much smaller.

The four compilers presented here can generate programs that require runtime modules or stand-alone programs. The programs that require the runtime module are much smaller, but you can't use them if you don't have the runtime package. If you have several compiled BASIC programs on the same disk, it's more economical to put one runtime module on the disk and have all the programs share it. The problem is that you must remember to copy the runtime module if you move the program to another disk. A second and more serious problem is letting the compiled program know where the runtime module is. Although stand-alone programs are usually much larger than their corresponding library-dependent versions, they're easier to share with other users. See Table 2 for the sizes of the benchmark programs and the runtime modules.

Table 2: File Sizes (in Bytes)

	AC/BASIC	F-BASIC	HiSoft BASIC	True BASIC
Sieve				
Library	3,300	35,108	1,468	692
Stand-alone	46,612	60,032	*	77,780
Graphics				
Library	11,160	6,176	6,920	$
Stand-alone	54,472	31,376	*	$
Integer Sort				
Library	6,612	12,560	3,216	1,991
Stand-alone	49,924	37,780	*	79,080
String Sort				
Library	6,720	5,156	3,472	1,996
Stand-alone	50,032	30,768	*	79,072
Matrix				
Library	4,980	8,916	2,548	875
Stand-alone	48,292	33,932	*	78,000
Floating-point				
Single-precision				
Library	7,320	7,056	3,776	%
Stand-alone	50,632	33,836	*	%
Double-precision				
Library	7,904	7,520	4,144	1,916
Stand-alone	51,216	31,504	*	79,152
Runtime Library	43,264	39,812	46,672	76,852

* The version of the HiSoft compiler used to conduct these tests would not generate stand-alone programs. This bug has been corrected in the latest release.
$ The True BASIC version of the graphics benchmark contained only one of the three sections. Therefore, the file sizes would be meaningless.
% True BASIC doesn't support single-precision floating-point numbers.

Compiler Speed

Table 3 contains the compile times for "The Hermit," a text adventure containing 581 lines of Amiga Basic source code (several of the other versions are quite a bit longer because of syntax requirements). As you can see, all the compilers are fairly quick, although *True BASIC* lagged behind the other three. The times given in the table represent the time it takes to generate a library-dependent version of the program. Generating a stand-alone version can take quite a bit longer with some of the compilers.

Table 3: Average Compile Times (in Seconds)

AC/BASIC	F-BASIC	HiSoft BASIC	True BASIC
57.34	57.75	59.10	89.27

AC/BASIC and *HiSoft BASIC* both have software switches which allow you to generate library-dependent or stand-alone programs. Generating a stand-alone program from *AC/BASIC* takes only a few seconds longer than generating the library-dependent version. I don't know how long it takes from *HiSoft BASIC*.

F-BASIC and *True BASIC* use a separate linkage program to combine a library-dependent program with their runtime module to produce a stand-alone program. The *F-BASIC* Link program is very fast. It takes only a few seconds to link, no matter how large or small the program. The *True BASIC* Binder is a different matter. Large programs, The Hermit, for example, can take several minutes to link. Fortunately, you usually only link once. If you had to use the Binder every time you wanted to test a program, the compiler would be virtually unusable.

Next issue, I'll take a close look at each of the BASICs. The discussion will include compatibility problems, ease-of-use, and other considerations and features that make the difference between a good programming environment and a bad one. ▲

AC/BASIC 1.3
$195.00
Absoft
2781 Bond St.
Auburn Hills, MI 49057

F-BASIC 2.0
$79.95
Delphi Noetic Systems
P. O. Box 7722
Rapid City, SD 57709

GFA-BASIC 3.0
$139.95
Antic Software
544 Second St.
San Francisco, CA 94107

HiSoft BASIC Professional
$159.95
MichTron
576 S. Telegraph
Pontiac, MI 48053

True BASIC
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Peggy Herrington

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There are several approaches you can take when creating music on the Amiga. Driving its four hardware sound channels with note-editing software is the simplest. The most elaborate is controlling MIDI-compatible devices like music synthesizers and drum machines—even synchronizing stage lighting—with MIDI sequencing software. Because of the Amiga's unique audio capabilities, a third method, that of combining MIDI output with internal voices, is gaining popularity. Other programs offer artificial intelligence to aid composition and help you synchronize music with animations for desktop presentations. In fact, with the aid of a video camera, genlock, and appropriate software, you can even make music videos. But, like all good musicians, let's take it from the top.

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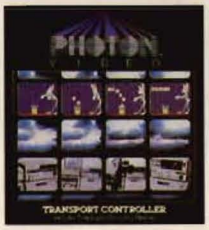

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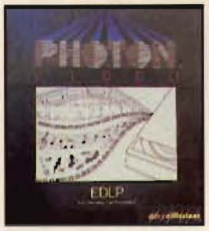

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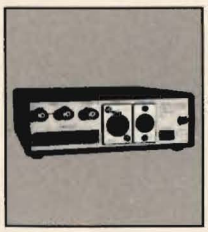

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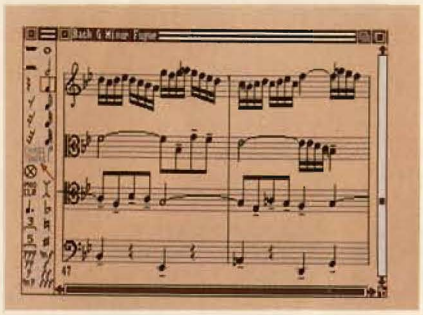
MUSIC

Mighty Note Editors

Playing with note-editing software involves the simple process of entering music note by note, measure by measure, using the mouse and keyboard of your Amiga. It's not fast, and while some people compose this way, note editors are usually used for transcribing sheet music into the computer, especially if you can't play "Kitten on the Keys" at tempo. After entering a piece, you listen to it in a separate step, arranging and refining it until you're satisfied, much as you use a word processor when writing a report.

If you're a practicing musician in the literal sense, note-editing software is the easiest approach to digital music. Although this process can be an end unto itself, an extension of it is to have the Amiga provide accompaniment while you play along with another instrument. This involves technical expertise and is an excellent way to develop your chops. It's a lot more fun practicing a violin with the aid of an Amiga than it is by following a ticking metronome.

The reigning king of Amiga note editors is *Deluxe Music Construction Set.* Its strength lies in its accurate standard music notation. Screen displays and printouts offer up to eight separate staves for MIDI and/or internally produced parts, along with guitar tablature and other items such as lyrics.

***Deluxe Music Construction Set* is the reigning king of note editors.**

Among other things, *Deluxe Music* offers control over amplitude (loudness), timing, and instrumentation. Although it doesn't offer a way to create instruments, its play styles let you change the way IFF instruments sound as they play, altering a single sample from legato to staccato with varying degrees of sustain and release. This is important because only a few instruments can be stored in memory at once, and applying appropriate play styles makes them sound as if you have more instruments at your disposal than you actually do. Several data disks are available for *Deluxe Music* owners, including *It's Only Rock 'N Roll* and *Hot & Cool Jazz.* These, and songs and instruments from *Instant Music,* are all interchangeable.

Although *Sonix,* another popular Amiga note editor, can play standard IFF sounds, too, its proprietary RFF instruments are far superior. That, and *Sonix's* built-in synthesis program for designing new instruments and realtime play-along ability are its advantages over *Deluxe Music. Sonix's* manual includes a great introduction to music in general. Aegis recently released 2 two-disk sets of music data, *SoundTrax I* and *II,* for *Sonix* musicians. These are collections of original music that you can play along with in key, one of the advanced techniques available with *Sonix.* The tradeoff for better sounds and snazzy techniques is that *Sonix's* music notation is substantially less accurate than *Deluxe Music's.* I find it less flexible when entering songs. *Sonix* offers a single grand staff, and it doesn't scroll the music as it plays.

It's a beautiful program, and you can have a lot of fun with it, but *The Music Studio* is the weakest of this group. *Music Studio* accommodates lyrics and scrolls your score across the screen as it plays (on a single grand staff), but its instruments, which you can design, are incompatible with other music programs. *Music Studio's* interface is decidedly different to an experienced Amiga

Composing with *Deluxe Music Construction Set*

Deluxe Music Construction Set (DMCS) is one of the best products available for creating music on the Amiga, especially when you need a strong "sheet-music" interface. I find its ability to save files in standard SMUS format makes it ideal for creating and editing scores for music programs that have poor editing capabilities.

Articulation, the type of attack and separation for each of a series of notes, is handled by *DMCS* with a technique called *play styles.* Traditional styles include staccato, legato, slow or sharp attack, and sustain. *DMCS* also offers limited control of vibrato and amplitude modulation with play styles which alter both speed and depth. I use play styles on a note-by-note basis to create passages with interesting and complex articulation. It's this feature that provides control over an instrument's sound, in essence, creating a new instrument on the fly. You need to invest time with it if you expect to take full advantage of *DMCS.* Just as an orchestral composer knows the characteristics of the instruments he or she uses, you should understand how play styles affect the sound of your IFF instruments. Otherwise, you ignore half of the potential of the instrument. I make a point of testing new instruments with a variety of familiar passages to determine the changes different play styles can produce.

DMCS offers three ways to enter notes. The first involves clicking on the note's symbol and then placing it on the score; this is a slow method at best. The second involves using the mouse and the Amiga keyboard. You select the note or rest duration with one hand as your second uses the mouse to control pitch and staff placement, and your third holds a cup of coffee. I generally use this for late-night editing. A third approach also makes use of the Amiga keyboard but incorporates a MIDI keyboard instead of the mouse. You have the added option of entering block chords as single keystrokes with this combination. One drawback is that you still need to reach for the mouse to enter a rest. I avoid this by substituting the rest with a note of the proper duration and then correct it later during editing. Despite this problem with rests, MIDI input is ideal for entering long passages.

Editing is where *DMCS* really shines, functioning much as my favorite text editor does for words. Features such as transposition, tempo control, dynamics, chord revoicing, block cut/copy/paste, ties, slurs, crescendos, decrescendos, clefs, and a strong adherence to standard music notation make it my choice for an all-around music-editing package. And, although it isn't designed to compete with dedicated music-printing programs, it prints scores that fit most of my needs. When compared to the other music-composition programs in my library, *Deluxe Music Construction Set* gets the heaviest use.

—Dan Travison

Dan Travison played French Horn for a West Coast Marine Band, various chamber orchestras, and wind-and-brass ensembles; he was also music editor for an Amiga disk-based magazine. His background as a programmer/analyst covers mainframe and personal computers. Dan currently resides in the San Francisco Bay area, where he serenades his neighbors from his semisoundproof MIDI studio.

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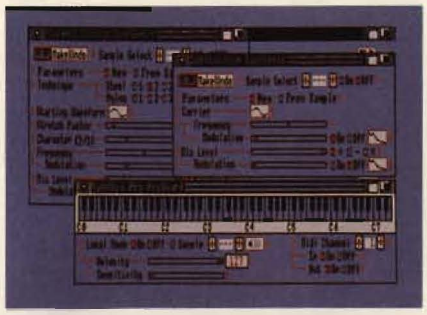
user, but the program has some unique qualities, such as changing instruments on each color-coded note, and it doesn't force you into strict measures. Like *Sonix,* you enter musical parts on tracks rather than on individual staves.

These note editors all play music from MIDI-connected synthesizers, although you can't enter it from the synthesizer in realtime. Instead, you enter it in step-time either from the Amiga's keyboard or the synthesizer, one note at a time.

Sampled Sounds

Instrument sounds played by the Amiga can be synthesized (by number-crunching, as with *Sonix, Music Studio,* and *Synthia*) or transformed into numbers with an audio sampling device like SunRize's PerfectSound Digitizer, which is especially powerful when used with *AudioMaster II* software from Aegis. Hardware and software are necessary for sampling, along with a microphone, CD player, or other line-level input device, but it's not as easy as whistling Dixie. You can sample anything audible and, as long as it's a brief sound, use it as a musical instrument since music composition software changes the pitch. But if you're looking to duplicate traditional music instruments, take note: Sampling sounds easy, but it isn't. The faithfulness of a sampled sound, as compared to the original, is dependent upon the amount of memory it uses, how skillfully you tweak and edit it, and the quality of your equipment. You'll have better success sampling unique sounds than you will trying to duplicate traditional instruments. You can also create IFF-compatible synthesized sounds from scratch with *Synthia.*



Synthia creates and modifies sounds through number-crunching.

Whether you play sampled or synthesized sounds, the Amiga produces 8-bit quality, offering four hardware sound channels which usually (but, as advanced *Sonix* owners know, not always) translate into four instruments. MIDI, on the other hand, offers professional-sounding 12- or 16-bit quality and a virtually unlimited number of instruments.

It's not pretty, but *KCS* is the top of the line in MIDI sequencers.

MIDI Perfectionists

You remember what *perfectionists* are—people who take pains . . . and pass them along to others. Not only are sounds produced by MIDI (Musical Instrument Digital Interface) sequencers superior to those produced by the Amiga, but MIDI sequencing software can also produce nonregimented tunes. Free-flowing and very musical ones. The problem with this approach for nonmaestros is that music must be entered by actually *playing* the black-and-white keys of a synthesizer; it's never typed in. You can play the parts slowly or use step-time entry and edit every note and rest numerically (no standard-notation displays here), but you'd

Playing with *MIDI Recording Studio*

Musical arranging and orchestration has always held a great fascination for me. Since age 8, when I first began studying piano, I have written arrangements for everything from small jazz combos to large marching bands. When I began working with computers, I was overjoyed at the fact that I could write an arrangement and not have to wait to bring together musicians to play it.

When Dr. T's Software released *MIDI Recording Studio (MRS)* for the Amiga, I decided to take the plunge into MIDI. I had already worked with *Deluxe Music* and *Sonix,* but *MRS* allowed me to try music in the MIDI format at a budget price.

MRS is a stripped-down version of Dr. T's *Keyboard Controlled Sequencer (KCS).* It can handle only 8 tracks as opposed to *KCS*'s 48 tracks, but it still has many of the features of its bigger brother. *MRS* doesn't require a synthesizer; you can use the Amiga's internal sounds and the Amiga keyboard to play each part. However, after some rather tedious and clumsy experiments, I purchased a synthesizer, a Roland D-10. The D-10 is a multitimbral linear analog synthesizer. It can play up to eight different instruments at the same time and also has a built-in programmable drum machine. It also has a velocity-sensitive keyboard which I find essential for creating "musical sounding" arrangements.

Because I spend a couple afternoons a week teaching private music lessons, I have created some play-along pieces for my drum students. I can set the D-10's drum machine to a specific rhythm and set its MIDI clock to be driven by *MRS.* I then overlay bass, keyboard, and lead instrument parts. Many of my drum students wanted to participate in their school jazz band, so I created original pieces for them to work with, focusing on various rhythm patterns and fills they must learn to perform.

Occasionally, realtime entry has its drawbacks. *MRS* does not allow for step-time note entry as does *KCS.* Sometimes I like to work out scores on a scoresheet as does a traditional arranger. In this case, I like to use *Deluxe Music Construction Set* to create up to eight parts using its MIDI capabilities. Then, by saving the *Deluxe Music* score in SMUS format, I can convert it into Dr. T's file format by using a utility called SMUS2T by S & B Software. I can then add solos or substitute the mechanical timing of certain parts by rerecording the part on the keyboard.

I have further rounded out my MIDI arsenal with Dr. T's *Copyist II.* This program lets me print music that has been created with *MRS* or that I have converted to *MRS* format. Now my students don't have to contend with my handwritten scrawl.

With each MIDI session, my fascination with arranging and composition continues to grow. The combination of Dr. T's software, my Roland D-10, and the Amiga 2000 make the possibilities almost limitless.

—Brian Conrad

Brian Conrad studied music at the University of Washington and spent over 15 years playing music professionally in the Seattle area. He now lives in southeastern Washington, where he teaches music and performs with various musical groups. Brian is a software developer and recently completed the Amiga version of SimCity *for Maxis Software.*

better be a dedicated musician to tango with a MIDI sequencer.

MIDI sequencers for the Amiga abound: Dr. T's *MIDI Recording Studio (MRS)* and *Keyboard Controlled Sequencer (KCS),* Sound Quest's *Texture,* Mimetics *ProMIDI Studio,* Circum Design's *MIDI Magic,* and MicroIllusion's *Music-X* (which is shipping as we go to press).

Aimed primarily at serious musicians, the top of this line is Dr. T's *KCS.* It's not pretty and offers neither standard-notation displays nor pull-down menus, but *KCS* is powerful, flexible, and simple to use (relatively speaking), plus it gets the job done exceptionally well. *MRS* is a bit more approachable for the beginning MIDI musician (as is *MIDI Magic,* with its more attractive screens but less attractive editing features), and it works equally well with Dr. T's extensive line of MIDI librarian/editors.

Dr. T also offers the only available professional music-printing utility, *The Copyist,* which converts MIDI data files into standard notation to produce splendid scores, especially on 24-wire-pin dot-matrix printers or laser printers.

Next in line is Sound Quest's *Texture,* fully mouse-accessible and Amiga-tized at last, followed by *Music-X.* The latter's claim to fame is full MIDI sequencing and editing, along with a built-in editor/librarian that can be configured to work with just about *any* MIDI-compatible synthesizer. And lastly, there's *SoundScape Pro MIDI Studio,* which still languishes for lack of a decent manual.

Jammin' with *Texture*

I'm hooked on music. As a songwriter, I've written hundreds of songs over the past 15 years; as a recording engineer-producer, I'm constantly laying down tracks in my 12-track studio. An Amiga running *Texture* neatly replaced my Roland MSQ-700 sequencer several years ago and now handes all the arranging.

But for composing, I use several inexpensive Casio keyboards (the SK-1, MT-240, and VL-1), which I take everywhere. They all have simple sequencers built in, and I've composed songs at the beach, in parks, or wherever an idea hits. By limiting myself to this simple instrumentation, I'm forced to concentrate on what really makes a song a hit: a good groove and a solid vocal.

Once I build this basic framework, I crank up *Texture* to do a full arrangement. *Texture* thinks about music like I do, in manageable chunks of Intro, Verse, Chorus, and Bridge. This solid, no-fluff sequencer has an ample 24 tracks to record on, in each of 96 patterns that link together to form songs.

Texture's screen layout is simple, and I can execute most commands with the mouse or fast keyboard equivalents to really keep things moving. The loop buffer is extremely handy; I can jam at length over a looping pattern and then audition each take to decide whether to keep an immortal soaring lead or quietly dispose of any embarrassing mistakes. But *Texture*'s best feature is its accessibility: It doesn't have cute windows or graphics editing; it does have solid meat-and-potatoes tools that work right and don't make me search for the manual or scream at the cat.

Once I've recorded the basic song into *Texture,* I flesh it out with the drum-machine parts, horn splats, string pads, synth leads, and so on. I like to record parts without quantizing, to maintain a live feel. Usually I'll only edit to correct an occasional wrong note in an otherwise good performance. If a part is too hard for me to play well, I'll quantize the note on events (but not the note lengths) and then time-shift the parts a few ticks forward to get "edgy," or I'll shift them even further to get in the groove.

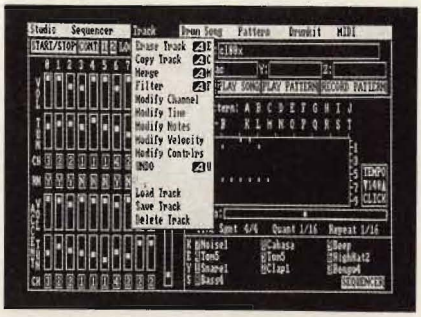
When I've fine-tuned the arrangement, I save it in the old version of *Texture,* which uses the Roland MPU-401 interface. The MPU-401 records an FSK tone on the sync track of my 12-track tape machine, so I can lay multiple overdubs to tape in perfect sync. By laying just one part to tape at a time, I can use any or all of my effects devices and synthesizers on every part, so each one can have its own complex sonic space.

A final word of advice: Beware of feature-itis! It doesn't matter so much whether a sequencer, patch editor or whatever has the latest, greatest buzzword feature. What does matter is whether it gives you quick, friendly access to the basic features you use day in and day out. *Texture* gets a thumbs-up in this regard.

Texture has been pounded on by pro users for five years now, and it shows. From vague idea to finished song, it gives me the environment I need to create, not cogitate. Because, as the old Jazz Man once told me, "When you think you be jammin' a great lead, you probably ain't. When you be playin' your best, you ain't got time to be thinkin'!"

—Ben and Jean Means

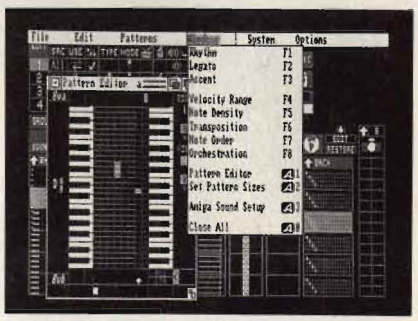
Ben Furia Means is a singer-songwriter, multi-instrumentalist, and the proprietor of his own 12-track studio, Zen YoYo Music. His wife, Jean, is a journalist.



***Dynamic Studio* is a dynamite way to mix percussion with MIDI music.**

Combining Internal and External Sounds

With the exception of *Texture,* you can use Amiga-produced sounds right along with those from MIDI-connected synthesizers with these sequencers. No other affordable personal computer comes with good enough sounds to do this. Among the exceptional sounds it makes are drum beats, which are used to advantage by *Dynamic Studio* from New Wave Software. *Dynamic Studio* doesn't offer standard music notation (it's a sequencer), but it is a dynamite way to combine Amiga percussion sounds with music from MIDI-connected synthesizers, especially a multitimbral Casio CZ-101 or Yamaha FB01 (keyboardless) expansion module, a combination that constitutes the perfect poor man's MIDI Studio.



Artificial-intelligence techniques shape the music in *Amiga M.*

Intelligent Music

Three programs on the market do more than save music that you enter: *Instant Music, Music Mouse,* and *Amiga M* [reviewed in the *Amiga Resource* Fall 1989 issue]. Of the three, the best suited for musical klutzes is *Instant Music.* Easy to use,

MUSIC

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Deluxe Music Construction Set (DMCS)
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The Music Studio
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(415) 329-0800

Music-X
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(800) 522-2041

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Barrie, Ont.
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(800) 461-5441

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Dynamic Studio
New Wave Software
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MusicMouse
Opcode Systems
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Menlo Park, CA 94025-9704
(415) 321-8977

Synthia
The Other Guys
P.O. Box 8
Logan, UT 84321
(800) 942-9402

Texture
Various MIDI librarians/editors
Sound Quest
5 Glenaden Ave. E
Toronto, Ont.
Canada M8Y 2L2
(416) 234-0347

PerfectSound Digitizer
SunRize Industries
3801 Old College Rd.
Bryan, TX 77801
(409) 846-1311

Instant Music lets you jam with your mouse. Pick a song, disable one of its four voices, and move the mouse up to make the sound of that instrument go up in pitch, down to make it go down in pitch, and so forth. Sophisticated templates keep mouse moves in key and on the beat with the other voices.

Music Mouse turns your Amiga into a complex musical instrument using either internal sounds or MIDI-connected synthesizers, and it's the only software mentioned here that actually requires performance practice. *Amiga M* is interesting, too. It uses artificial-intelligence (AI) techniques to vary musical parameters, again internally or via MIDI, and offers a surprising degree of control over permutations. Both programs present intellectual challenges to the experienced musician.

Animated Music

Several programs (*The Director, Deluxe Video,* and *MovieSetter,* for example) help you synchronize sound effects with graphics (like footsteps and screams), but only recently has software for synchronizing *music* with animations come along. MindWare's *PageSync,* scheduled for late summer availability, is compatible with MindWare's animation software (and others, no doubt). Designed to synchronize things such as drum beats with action, and vice versa, *PageSync* promises to open the world of music videos to Amigans. And professional video folks will no doubt be interested in a spiffy new *SMPTE Time Code Reader* from MicroIllusions, which is also set for summer release.

Instrument of Choice

As you can see, music products for the Amiga are beginning to mature. Not only can you take your pick of note editors, sequencers, fascinating AI programs, and music-video methods, but, by using a compact music play utility (such as that available in *Synthia,* from The Other Guys), Paula, the Amiga's music coprocessor, will perform your favorite tunes in the background while you work, totally unaware of other programs you might be multitasking. You'll never regret connecting the Amiga's audio output to your stereo, even if you only listen to it in monophonic mode. It puts out wonderful music.

Whether you stick to internal sounds or expand your system into a home MIDI studio, for my money, the Amiga is the best musical instrument on the market today. It has advantages for the amateur and professional musician alike, many of which no other personal computer offers, and it's the only thing I have ever even considered trading for the piano I've played since I was a kid. While I have roughly the same investment in both of these systems, my piano won't print sheet music, gets downright hostile if I don't practice, chokes on animation and drum sounds, messes up online, and refuses to help me write stories about the joys of making music. Is there any wonder the Amiga has replaced it as my principal instrument? ▲

Peggy Herrington has been writing about computers since 1983, and her articles have been published by Commodore-oriented magazines worldwide. She writes in her home MIDI studio in the San Francisco Bay area, specializing in telecommunications and music, the latter in which she holds a degree.

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EDITED BY MICKEY McLEAN

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Amiga User Groups
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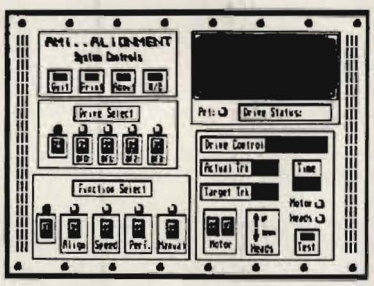

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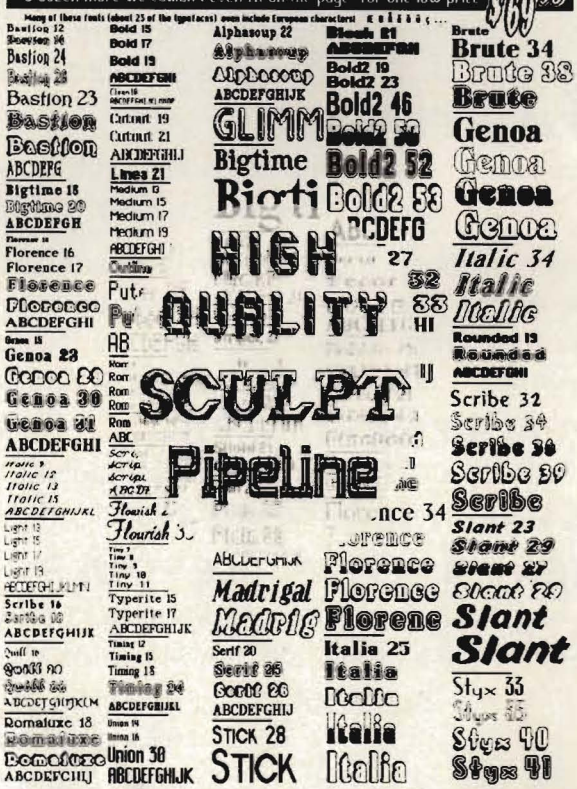

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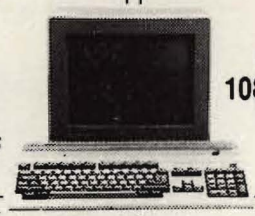

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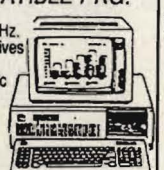

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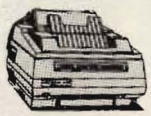

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PageStream

Soft-Logik Publishing
11131F S. Towne Sq.
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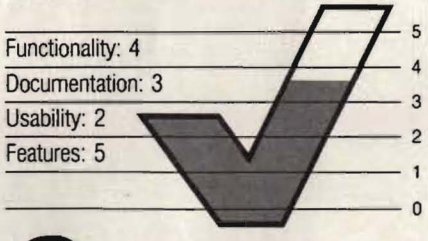

Owning *PageStream* is kind of like owning a used Mercedes. It's loaded with options, but they have an annoying habit of not working correctly when you're showing them off to your friends.

Soft-Logik's long-awaited and long-advertised desktop publishing program is finally available, and it was worth the wait. Packed with features not found in any other Amiga page-layout program, *PageStream* creates unrivaled output on almost any printer, dot-matrix or laser. Unfortunately, the first two releases of the program have lacked polish, and learning to work around the bugs can be a frustrating experience.

But that's not to say the program isn't worth using, especially if you don't own a PostScript laser printer. While document-creation features are important in a desktop publishing program, it's the final output that really matters. And nothing comes close to matching *PageStream*'s output on Preferences-supported printers. A page printed on a 300-dpi Hewlett-Packard DeskJet inkjet printer could easily be mistaken for one created on a PostScript laser printer.

PageStream manages its smooth, dense output by using outline fonts, similar to those used in the PostScript page-description language. Unlike the bitmap fonts supported by the Amiga operating system, outline fonts can be resized, rotated, and otherwise manipulated without causing blockiness or distortion. And, because they are described by the shape of their outline instead of as a series of dots, they can be printed at any point size and at the highest resolution supported by your printer.

PageStream includes ten fonts, and each of these can have up to 12 styles applied to them, including boldface, italics, back-slant, mirror, reverse, and strike-through.

This flexibility comes at a price: You can't use standard Amiga bitmap fonts with the program. You're limited to the supplied fonts and supplemental font disks sold by Soft-Logik.

Putting text on the page with this program is simple; you can turn on rulers, a grid, and onscreen guidelines to aid in precise text placement. The real flexibility comes from the fact that *PageStream* breaks from the Amiga desktop publishing convention of using boxes for text placement. If you want to place a headline on the page in most programs, you'd have to place a box outline on the page and then type the text in that box. Not so in *PageStream*—just click on the page and start typing. Text added this way is treated as a structured graphics object and can be rotated, distorted, bent, or stretched.

While this method of text placement gives you flexibility for adding headlines or decks, you'll usually want more precise placement of body text. No problem here. You can easily define columns on each page using a requester that lets you set the number of columns, the size of margins on all four sides, and the amount of gutter space between columns, and choose whether to link the columns together. These settings can affect a single page or the entire document.

PageStream also lets you create up to 255 text *tags*, templates that store formatting information like font, point size, style, spacing, leading, kerning, and color. This makes it a snap to add formatting to text: Just highlight a block of characters and select the appropriate tag. You can create standard formats for headlines, cutlines, and body copy and store them in tags, saving you from having to go through the same setup process every time you begin a new document.

You can polish the look of the text once you've placed it on the page using the batch-hyphenation and kerning features. And if some errors do slip into your text, *PageStream* includes a spelling checker and search/replace capability, just like your favorite word processor. Unfortunately, the spelling checker has a very small dictionary, so plan on adding many common words to it when you first start using the program.

There is one weak link in *PageStream*'s text-handling capability, though—text import. *PageStream* currently only brings in text from one Amiga word processor, *WordPerfect*. It will also import plain ASCII text files. Although Soft-Logik says it is planning on adding more import modules later, at the moment, unless you own *Word-*

Perfect, you'll have to add all formatting and styles to text after importing it into *PageStream*.

PageStream's graphics support is unmatched. Not only will the program import standard IFF-bitmap graphics, but it will also accept *Aegis Draw* structured graphics, *Ventura Publisher* .IMG clip art, Encapsulated PostScript files from *Professional Draw* or Macintosh programs (for laser output only), and a number of Atari ST graphics formats.

But for many of your graphics needs, you may never need to import images from another program. *PageStream* includes a complete set of tools for drawing object-oriented graphics directly on the page—circles, lines, boxes with square and rounded corners, polygons—and a Filled Arc tool perfect for creating pie charts. Line widths are definable to any point size, and there are 40 different editable fill patterns.

Graphics can be moved, resized, and distorted after they are placed on the page. You can group a number of graphics elements together and manipulate them as if they were a single object. Once graphics are placed, *PageStream* gives you five different ways to wrap text around them.

Of course, all of these fancy graphics and text-manipulation features don't mean a thing if the final printout isn't up to par. But *PageStream* has no problems in that department. If you're using any non-PostScript printer with your Amiga, you'll be hard-pressed to find a program that can come close to *PageStream*'s output quality, especially using higher print densities. The program includes its own printer drivers and supports both color and black-and-white output. If your printer isn't directly supported, you can print using a standard Preferences printer driver, but in black-and-white only.

PageStream also supports PostScript laser printers. However, it uses its own fonts rather than the higher-quality typefaces built into the printer. If you plan on using the program for PostScript output, you should purchase the supplemental font disks that include *PageStream* definitions for the standard Adobe PostScript fonts.

If you rate programs simply by sheer number of features, *PageStream* wins the Amiga desktop publishing war hands-down. Unfortunately, the program is somewhat unstable: It's far too easy to crash, and some of the features don't work properly. When you make style changes to text on the screen, you often have to click on the scroll bar to make the program update the screen and show the alteration. And while *PageStream* 1.6 doesn't bring visits from the Guru as often as the first release of the program, it's still possible to crash it without much effort. If you're using the Arc tool and place three points in a line, you get a Guru. If something in a clip-art file confuses the graphics import modules, the program sometimes locks up, ignoring all further mouse and keyboard input. Soft-Logik recognizes these problems and is working on another update that will address many of them.

Buggy or not, *PageStream* is still the most feature-packed desktop publishing program on the Amiga. If you are creating output for PostScript printers or typesetters, you should probably look at a program that has built-in support for PostScript fonts. But for owners of dot-matrix, inkjet, or non-PostScript laser printers, you won't find another program that can match *PageStream*'s output. If you can tolerate having to work around a few bugs, check out this program.

—Denny Atkin

Populous

Electronic Arts
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San Mateo, CA 94404
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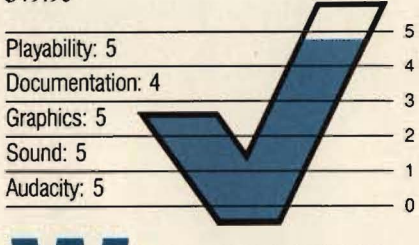

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That's the question *Populous* asks. The answer comes from you.

Because of the elegance and wit with which the game's designers have framed their question, the game is more provocative than blasphemous.

Populous places you at the creator's table, a golden Book of Worlds open before you. The book's pages show a map of an entire world, while the center of the screen displays a closeup view of one portion of the world. You can scroll through the closeup to see the terrain of your domain—and that of your enemies. Those enemies are controlled by their own god, with that role being played by the computer or by a human opponent via modem. Only one race can emerge triumphant.

It's a sparsely populated place at first, with a few inhabitants scrabbling out their existence in crude huts. As their god, you can make things easier for them. Create, raise, and lower land, smoothing it to make settlement simpler. Watch those huts become homes, and the homes become turreted castles. Expand! Guide your growing number of followers to new lands, leading them ever closer to confrontation with their enemies. As population and quality of life increases—reflecting your divine effectiveness—so do your powers.

All of this is controlled by way of an elegant interface that uses icons and mouse to superb effect. A power bar—designed, as is the Book of Worlds and, for that matter, the entire screen, to enhance the mythical illusion—shows just what powers are available to you. Those powers are ac-

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Bullfrog and Blasphemy

Is *Populous* blasphemous?

That's not a trivial question. Because the game places you in the position of a god, it leaves itself open to charges of blasphemy. A random survey of our own staff found two people who felt that the game crossed the boundary of good taste, another who thought *Populous* openly blasphemous.

The game's designers were certainly aware of the risks they took. But they also have a healthy perspective; *Populous* is, after all, just a game.

Bullfrog: The team behind *Populous*.

"We don't even think of it as religious," says Peter Molyneux of Bullfrog, the British software group that created *Populous*. "When we were designing it, we thought of the two sides as good and evil, period. And we'd make up different sides—labor and conservative, pro and con, et cetera." Certainly they had no specific religion or sect in mind as the game came to life.

While there's no large, deliberate blasphemous content, an irreverence flows through the game and through conversation with its creators. They communicate a Monty Python–ish exuberance for word- and image-play, rude noises, and other jovially disrespectful approaches to life and art.

Underlying the humor is a seriousness, though. It shows first in the game: Bullfrog is serious about its concepts and about getting everything possible out of the Amiga.

More subtly, though, Bullfrog has taken perhaps the final step in finding out just how far the solitude and even solipsism inherent in computer games can go. Every game player has moments of godlike power; the simulated universe becomes more real than reality and more appealing because of our own power over it.

Bullfrog has taken that aspect of gaming and made its implications explicit, as well as royally enjoyable. For that, they deserve the gaming community's gratitude—but not, of course, its worship.

—K.F.

cessed via icons that appear to be inset tiles in the creator's tabletop.

The icons give you a variety of godlike options. You can create knights and send them forth to wreak havoc on the enemy. Or you can wreak havoc of your own: As a god, you are able to create earthquakes, volcanoes, floods, all aimed at lessening your opponents' strength.

The most important task you face, though, is building your population, creating hordes of followers who exist to destroy the enemy. Worlds begin with your people and their opponents separated by water. It's up to the god to build the land bridge that allows the people to migrate and, ultimately, launch their crusade. It doesn't pay to build the land bridge too quickly, though. Build your population first; then lead your crusade.

Several tools are at your disposal. Perhaps the most powerful of them is the Papal Magnet, your symbol on earth. Your people are attracted to the magnet, and from it are created knights, the superwarriors whose destructive powers have to be seen to be believed. A knight laying siege to an enemy encampment is a fearsome vision indeed. The magnet can be moved to give your people a destination ever closer to the enemy. The control interface is simple and practical, although proper positioning of certain cursors and objects may take a little time.

Populous entertains at every level. Graphics and sound work together to create and maintain a certain godlike mood. *Populous*'s soundtrack is a stately dirge, a weirdly echoing music of the spheres that plays perfect accompaniment to your megalomaniac tendencies.

The game's graphics are even more impressive than its sound. Screen layout is superb, combining thoughtful and practical control icons with atmospheric design. It's a stylish screen, one that goes a long way toward creating the convincing illusion of omnipotence. (A talking congratulatory screen that follows your triumph, though, is a mistake and should have been left out.)

The closeup view is the program's centerpiece, the place where the action occurs. It's a vivid screen, across which your people walk, settle, build, and make war. You can also build your own worlds, further extending the game's godlike feel.

Game mechanics remain the same from world to world among *Populous*'s hundreds of scenarios, although the settings vary greatly. There are green, verdant worlds, desert planets, ice worlds—a cosmos filled with planets and people awaiting your divinity. Opponents grow ever more difficult as you climb the celestial ladder. It doesn't take long to encounter tougher gods, more vicious opponents.

Documentation is thorough and literate, and it contains hints that can make your celestial tenure more successful. But you don't really need the documentation to start playing, and, once you've started, you're unlikely to pause to read.

Populous is a stunning program, designed to the hilt and as audacious as any computer game I've seen. This, I think, is what we mean when we differentiate between computer games and videogames. *Populous* is a *computer* game, among the best ever written.

God, I love it.

—Keith Ferrell

A-Max

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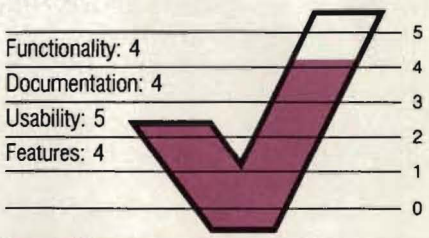
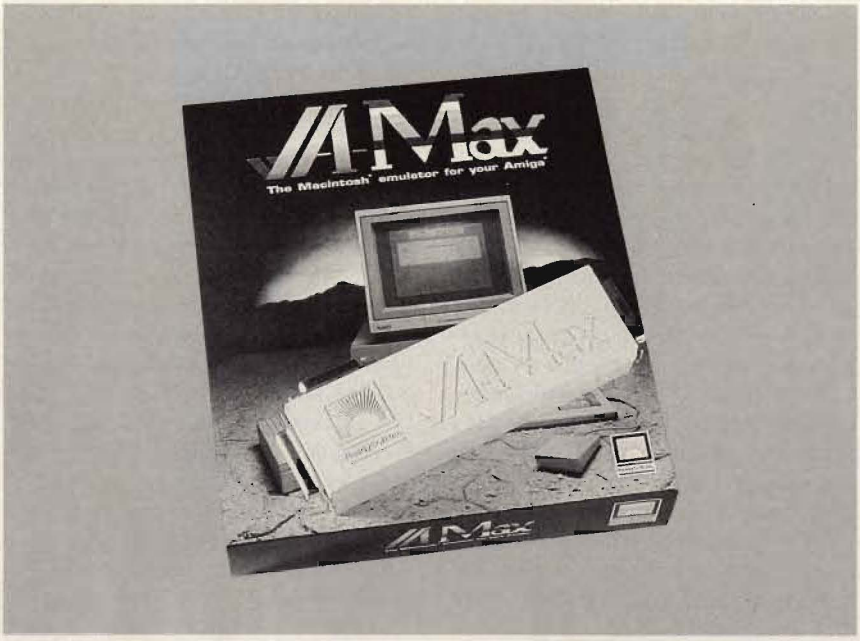


The Amiga is a powerful and versatile personal computer, but sometimes technical excellence just isn't enough. With the personal computer market dominated by IBM and Apple, many computer owners want compatibility. So far, Commodore's A2088 and A2286D bridgeboards have been able to provide PC compatibility for Amiga owners who need it. Now, with the release of



ReadySoft's Macintosh emulator, A-Max, Amiga owners can run Macintosh software as well.

If you've been disappointed in the past by the limited compatibility and slow performance of some of the previous emulator products on the Amiga, let me reassure you right from the start: A-Max works, and it works well.

The A-Max package uses a combination of hardware and software to achieve Mac compatibility. The hardware component is a small interface box that plugs into the external disk drive port of the Amiga 500, 1000, or 2000. This box performs two functions. First, it provides an interface for an (optional) external Macintosh floppy drive. Second, it provides a place to plug in a set of 64K or 128K Macintosh Operating System ROMs. The ROMs are necessary to avoid the thorny copyright problems that would arise from trying to emulate the Macintosh's proprietary Operating System code.

Apple jealously guards the Mac's user interface and has shown a willingness to launch a massive legal assault on anyone who tries to copy it. Rather than try to defy Apple, ReadySoft neatly sidesteps the copyright infringement question by requiring A-Max users to obtain their own legal copies of genuine Macintosh ROMs. The older 64K ROMs are readily available at about $40 a set. The 128K ROMs, though a bit rarer, can still be obtained from a number of sources at prices in the range of $125–$175, depending on availability. Although ReadySoft itself does not sell these ROMs, the A-Max manual contains a list of vendors. Once the Apple ROMs are in place, the A-Max software adapts the operating system software to the somewhat different hardware configuration of the Amiga. The result is an Amiga that thinks it's a Macintosh and runs almost all Macintosh software.

Despite the degree of compatibility afforded by the use of actual Macintosh ROMs, there are still some important hardware differences between the Amiga and Macintosh computers. These differences have an impact on A-Max emulation in the following areas:

• **Disks.** Because of the variable-speed format used by Macintosh drives, it isn't possible to read a complete Mac disk in an Amiga disk drive. That doesn't mean you can't use your Amiga floppies with A-Max. The A-Max software formats, reads, and writes disks in the Amiga drive, using its own proprietary 800K A-Max format that is compatible with neither the Macintosh nor the Amiga format. In order to get some Macintosh software onto those A-Max format disks, however, you'll need to use a Macintosh or an external Mac drive.

The easiest way to access Macintosh software is to buy or borrow an external Macintosh drive and plug it into the A-Max interface port. Although most Mac drives should work, I ran into a couple of drive types that wouldn't, including a genuine Apple model. ReadySoft is working on greater compatibility, but, for now, I'd recommend the Cutting Edge drive, an inexpensive unit that works well with the emulator. Once the Mac drive is plugged in, you can use the Macintosh Finder to copy an entire disk from Mac format to A-Max format, or vice versa (as long as it's not copy-protected).

For those with access to a single-drive Macintosh, ReadySoft provides a less convenient but workable alternative. Since it is possible to partially read a Mac disk in an Amiga drive, you can use the provided transfer software to create a 272K Mini Transfer disk on the Mac that can be read directly on the Amiga. Although it's difficult, it is possible to use the Mini Transfer format to create a small A-Max boot disk. Once you have the Macintosh system up and running on the Amiga, you can use the software on the A-Max utilities disk (which is itself in Mini Transfer format) to transfer the contents of an entire disk by dividing its contents onto three mini disks and then reassembling them on the Amiga. Finally, for those of you with access to disks produced by one of the Macintosh emulators that run on the Atari ST, A-Max also will read disks in that Magic Sac or Spectre 128 format.

One major difference between Amiga and Mac disks is the method of ejecting disks. Mac disk drives have no eject button; disks can only be ejected under computer control. This allows the Mac system to make sure that a disk is not removed before the drive has finished writing to it, which prevents accidental damage to the disk. Amiga drives, however, depend on the user to eject the disk by pressing the eject button at the appropriate time. To ensure that disks are only removed when it's safe, the emulator software displays a large drive letter in the window bar when it is time to remove a disk. It may take Amiga users a while to get used to telling the computer to eject a disk and to remove the disk only at certain times, but it is absolutely necessary. Forgetting to follow these rules can destroy not only the

disk that you've removed, but the next one that you insert as well.

The first version of the A-Max software contains no support for Amiga hard drives. This is unfortunate, since the Mac is as disk-intensive a machine as the Amiga. Hard drives increase disk-access speed and eliminate the disk-swapping that can make the Mac such a pain to use. Moreover, some programs require a hard drive. ReadySoft will try to add support for some Amiga hard drive controllers before the end of the year, starting with the A2090 found in the 2000HD.

In the meantime, however, it is possible to use part of the Amiga's memory as a ramdisk that functions like a fast Mac hard disk. The contents of the ramdisk are preserved between restarts of the Mac and usually survive Mac system crashes as well. This makes it possible to copy the system disk to the ramdisk and to reboot from the ramdisk (much like booting from the recoverable ramdisk on the Amiga). Still, the size of this disk is limited by your system RAM, and it must be reloaded each time you start the emulator.

• **Sound.** The Amiga sound chip is vastly different from the Macintosh hardware, so much so that the only sound effect that A-Max supports is the system bell. Although a lot of Mac software uses digitized sound, the current emulator software doesn't support the sound features of any Mac program (such as the ones in *HyperCard*). Still, David Small has proved that sound emulation is possible. The latest version of his Spectre 128 emulator software for the ST has full sound support, despite the differences between the machines. Although A-Max author Simon Douglas is not convinced that Mac sound can be added to the emulator without seriously degrading performance, this is an issue that we'll just have to wait and see about.

• **MIDI Support.** All MIDI software on the Mac addresses the hardware interface directly. Since this interface is completely different from the MIDI interfaces used on the Amiga, no Mac MIDI software works with A-Max, and it's extremely unlikely that it will ever work. Fortunately, the base of native Amiga MIDI software has been growing lately, making this deficiency of the emulator a little easier to live with.

• **Printers.** The Macintosh system was designed to work only with the Apple ImageWriter dot-matrix printers and Apple LaserWriter laser printers. If you own an ImageWriter, you can hook it up to the Amiga serial port and use it with A-Max just as you would with a Macintosh (the emulator lets you use either a parallel or a serial port for the printer, and it lets you use the serial port for a modem as well). A-Max also supports the use of Epson-compatible 9- or 24-pin printers, though the aspect ratio of the printout will probably not be the same as on the ImageWriter.

With more Mac owners turning to non-Apple printers, a larger variety of drivers have become available for third-party printers. A company called

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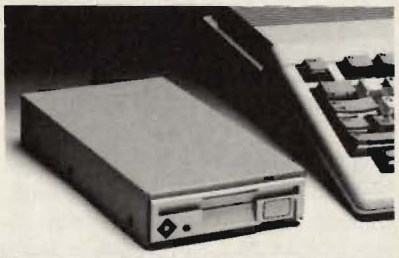

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SoftStyle sells several collections of printer drivers that enable a number of non-Apple printers to be used with the Macintosh. I tried the company's *Toshstart* program with my 24-pin Toshiba printer, and I was able to print both text and graphics from programs such as *MacWrite* and *MacPaint* flawlessly. SoftStyle sells three different versions of its *Printworks* programs, which allow the use of many dot-matrix, daisywheel, and non-PostScript laser printers with the Mac.

The printer of choice on the Mac has to be the Apple LaserWriter. The fine control offered by its PostScript page-description language has played a large part in making the Mac such a popular machine for desktop publishing. A-Max doesn't support the LaserWriter directly, however, because its Mac programs try to send their LaserWriter output through the AppleTalk bus, which the Amiga lacks. Amiga owners with a LaserWriter (or other PostScript-compatible laser printer) have to print their files to disk and then send them to the laser printer using the File Dump program included with the A-Max software. This situation may change in the future. Several Amiga hardware companies are working on AppleTalk hardware on the Amiga. At the same time, the Macintosh system software is moving toward support of non-Apple PostScript printers.

• **Screen Display.** The Macintosh has a 512 × 342 pixel monochrome display. Amiga users, on the other hand, can choose between a hi-res 640 × 400 interlace screen and a medium-res 640 × 200 noninterlaced display. The A-Max emulator software provides a number of ways to reconcile the two displays.

The interlace display gives you a true aspect ratio and allows you to see all of the screen at once, but it flickers somewhat. Using the default A-Max colors of white on blue helps reduce this flicker. The best solution, of course, is to use a Flicker Fixer board in the 2000, along with a multisync monitor. Switching to the noninterlaced display eliminates the flicker, but it also makes the objects onscreen appear tall and skinny and limits you to seeing half the screen at any one time. Although this mode makes the Mac Finder look like GEOS on the Commodore 64, it is still quite usable. The emulator software lets you choose between scrolling the display as you move the mouse (which works surprisingly well) or switching halves of the display when you press the right mouse button.

The 640 × 400 screen on the Amiga gives you almost 50 percent more display area than on the original Mac. Although some Mac programs limit themselves to a 512 × 384 screen, most well-behaved programs have been written to automatically adjust themselves to the larger displays that are available for the Mac and Mac II. Thus, programs like *MacWrite, Microsoft Word,* and *Excel* take advantage of the extra screen area and show you more of your data on an Amiga monochrome display than you would see on a Macintosh screen. For those programs that absolutely require a true Mac display, however, A-Max lets you select a 512 × 384 display.

In the near future, some new display alternatives will become available for the Amiga, and A-Max supports all of them. The emulator software supports the A2024 and Viking Moniterm monitors, both of which can display 1008 × 800 pixels, noninterlaced. It also supports the Enhanced Chip Set (ECS), which consists of new Fat Agnus and Denise chips. With the ECS set installed, A-Max gives you a 640 × 480 noninterlace monochrome display on a multisync monitor. It even supports a 640 × 960 interlaced ECS display (though you need a pretty sharp monitor for this one to be useful).

• **Processor speed.** The 68000 processor on the Mac runs at a speed of under 7 MHz, while the Amiga's processor runs at slightly over 7 MHz. In addition, the Amiga display hardware operates more quickly than does that of the Mac. The net effect of these differences is that most Mac software runs about 10 percent faster on the Amiga using A-Max than it does on a regular Mac! Moreover, with the 128K ROMs, the Mac Operating System supports advanced Motorola processors. This means that you can run A-Max on an Amiga 2500 with its 68020 processor at near–Mac II speeds. Interestingly, although all Mac speed test programs recognized that the 2500 used a 68020 processor, none of them recognized its 68881 floating-point coprocessor or its 68851 memory-management unit.

• **Memory.** Real Macintoshes all have one contiguous block of memory. The Amiga memory map can be much more fragmented, however. To make matters worse, the Mac system expects the display RAM to be at the top of the memory space, but the chip RAM in which the Amiga display memory must be located is at the low end of the memory map. A-Max uses a number of tricks to combat these problems, and in most cases they work well. Most Mac programs will run OK with expansion memory. In some cases, use of the Mac MultiFinder helps manage these disparate memory segments. But in other cases, you will need to use chip memory only. Obviously, a megabyte of chip memory (which requires the new Fat Agnus chip) will give you the best compatibility. The other memory will still be usable as a ramdisk, however.

How well does A-Max work? The answer is that minor differences aside, it runs most of the currently popular Mac software as well as, if not better than, a Mac does. I was able to run programs such as *Microsoft Word* 3.01, *dBase Mac, More II, MacWrite* 5.01, *MacPaint, MacDraw, Aldus Freehand,* and *SuperPaint.* The only major program I had problems with was *Excel,* which had to be run using chip memory only. I was even able to use terminal programs such as *Microphone II, Red Ryder, Free Term,* and *Term Works* to download a wide variety of public domain and shareware programs, and most of the programs ran without problems on A-Max.

In general, A-Max's compatibility is highest in the area of business software. Fortunately, this is the one area where Mac software can really contribute to the usefulness of the Amiga. After all, Amiga owners don't really need (or want) to play the kind of two-dimensional monochrome games that are found on the Mac.

While A-Max may not be perfect, it opens up a whole new range of computing possibilities for about $300. For that kind of money, it may be worth buying A-Max just to see your friends' jaws drop when they see you running Macintosh software on your Amiga.

—Sheldon Leemon

MINI-REVIEWS

Mini-review contributors this month include Rhett Anderson, Steve Anzovin, Denny Atkin, Charles Brannon, David Hensley, Jr., Steve Hudson, Randy Thompson, and Troy Tucker.

Blood Money

Psygnosis
P.O. Box 483
Addison, IL 60101
$39.95

Blood Money reminds me of what the Amiga chip set was designed for—and it wasn't desktop publishing, spreadsheets, or even desktop video. The Amiga chip set (as opposed to the Amiga as a whole) was designed for the ultimate videogame machine. And *Blood Money* on an Amiga looks as if it's running on a coin-operated arcade machine.

Blood Money has the pedigree of a champion: one megabyte of graphics, 250K of digital sound, a rich musical score, and an opening screen that would make Steven Spielberg gape. Unlike many Amiga games, this one swarms with moving objects (sprites). The programmer, through proprietary mathematics, has overcome the limit on blitter objects and smooth scrolling that seem to restrict other games I've seen.

Blood Money starts you out with $200, with which you must visit one of four planets. (Actually, planets 3 and 4 require $300 and $400, respectively, so you'll have to conquer the first two planets first.) Each planet swarms with hostile life and technology. As you cruise in your helicopter or submarine, or you jet-pack through a labyrinth, shoot everything in sight and dodge incoming fire and dangerous landscape features such as chomping maws. Some creatures are worth coinage if you shoot them enough times—hence, the name of the game. By visiting equipment depots, you can buy additional firepower, engine prowess, or lifetimes.

Blood Money is a quintessential action game, the kind that has you bucking about in your chair and wrecking your joystick. So many designers feel they need to use the Amiga's computing power, keyboard, and memory to create sophisticated simulation games, but *Blood Money* takes a rather simple concept and uses this power to pump up the gameplay, graphics, and sound.

If you're like me, you'll be disappointed to discover you can't play very well. This is a very difficult game, made so by the sheer number and speed of your enemies. I know that I'll never beat this game, and the only ones who can are the same ones who in the late 1970s used to roll over the score counters on *Defender* and *Centipedes*. So, you video jocks, *Blood Money* has thrown down the gauntlet. Let's see if you've got the right stuff to pick it up!

–C.B. ▷

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DIGITAL DYNAMICS, 739 Navy Street, Santa Monica, CA 90405
Tel: 213-396-9771

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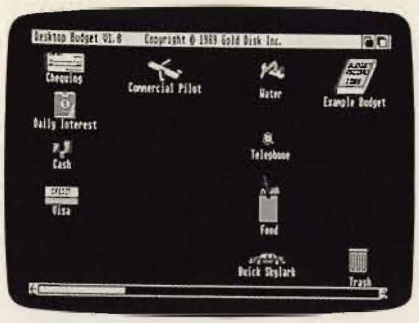
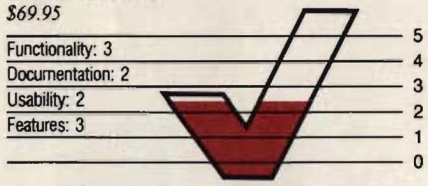


Desktop Budget

Frame Grabber

Desktop Budget

Gold Disk
2171 Dunwin Dr.
Mississauga, Ont.
Canada L5M 2C2
$69.95



Managing your home finances on a computer is the wave of the future, according to Gold Disk. *Desktop Budget* aims to make your Amiga an easy-to-use money-management tool.

The program takes care of basic home-budget operations: creating new budgets, recording deposits and payments, reconciling accounts, and preparing monthly and year-end statements. You can set up an unlimited number of accounts, split transactions, and transfer funds from one account to another. A nice feature of *Desktop Budget* is that you can tag tax-related transactions and prepare reports at tax time.

Personal-finance programs should be simple to use and transparent in operation, but *Desktop Budget* is more complicated to use than it should be. For example, the icon interface is cute, but it doesn't add much to the program's functionality. It requires unnecessary effort to select, design, and name icons—effort that could be better used in entering transaction information. For data entry, requesters that more closely duplicate the types of forms you use at home—checks and bank statements—would have been a better choice.

Features that this program should provide but doesn't are check printing and importing and exporting data from Amiga spreadsheets such as *MaxiPlan*. *Desktop Budget* could also be more robust; I crashed the program within five minutes simply by attempting to save a new cash account to a write-protected disk.

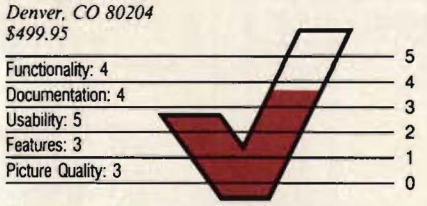
Documentation of any financial program is of crucial importance, especially for people organizing their finances for the first time. Unfortunately, the manual for *Desktop Budget* plunges directly into the minutiae of the program structure without the general budgeting advice most users will need. Several tutorials are provided, however, to help you apply the program's features to your own needs.

Compared to other personal-finance programs, most notably *Quicken, Desktop Budget* just doesn't measure up.

—*S.A.*

Frame Grabber

Progressive Peripherals & Software
464 Kalamath St.
Denver, CO 80204
$499.95



Capture pictures instantly from your TV or VCR. Snap video stills of your kids with a click of a mouse. You don't have to stop the action to steal a scene with Frame Grabber.

Frame Grabber's speed can be attributed to its internal RAM, which works as a super-fast video buffer. When you select Grab Image, the picture's raw data is downloaded into the buffer within 1/60 of a second; the Amiga then takes a few seconds to translate the video data into a format that it can display.

Once connected to the Amiga's parallel port, RGB port, and RGB monitor, the Frame Grabber is incredibly easy to use. You can view your input source live via your Amiga's RGB monitor and then simply hit C to capture it. Intensity, Hue, and Saturation knobs allow you to adjust the picture's brightness, tint, and color level before digitizing. Of course, you can save your pictures in standard IFF format, as well as adjust the colors, change the screen format, and even animate a series of digitized frames.

An upgrade to the Frame Grabber software that adds many more features, such as image resizing/stretching and better color control, will soon be available. I've seen preliminary versions, and the upgrade looks great. If you plan to buy a Frame Grabber, inquire about the upgrade—you'll want it as soon as it comes out.

Frame Grabber's strong suit is its ability to digitize moving color images in one shot. Unlike Digi-View, you don't need to make three passes with a color wheel or color splitter to capture a picture's red, green, and blue components (you can, but you don't have to).

Complaints? I had some difficulty obtaining high-quality pictures. Dotted lines often appear vertically across the screen, and thin bars line the very top and bottom portions of the image when you digitize from a weak video signal.

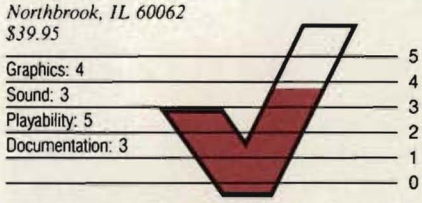
Overall, NewTek's Digi-View digitizer produces somewhat cleaner-looking pictures (at a much lower price) than does Frame Grabber. But if you're planning to capture moving im-

ages or to digitize color images without having to resort to using color wheels or color splitters, Frame Grabber's ease of use and full-color support make it a superior product.

—*R.T.*

Action Fighter

Sega
Distributed by Mindscape
3444 Dundee Rd.
Northbrook, IL 60062
$39.95



At first glance, *Action Fighter* appears to be just another *Spy Hunter* clone, but after playing it several times, you quickly realize that a few tricks have been added to enhance an old concept.

You control a top-secret land/air vehicle that can alter its form as it moves. Race through city streets and collect special lettered parts that give you the ability to change the vehicle's shape. You start with a motorcycle, but if you collect letters *A–D*, you can transform your vehicle into a sleek sports car. Collect letters *A–F*, and your sports car sprouts wings and rockets skyward.

Your primary goal is to complete five assault missions assigned by the president. Each mission requires you to navigate through a hostile city, then through enemy airspace until you reach your primary target. After completing one mission, you are transported automatically to the next city to begin another.

Primary targets are heavily protected. You earn points by destroying everything in sight. In the cities, you'll encounter kamikaze cars, ambulances, and motorcycles, as well as an assault chopper. In later rounds you have to be even more careful because some of the enemy vehicles are fitted with guns.

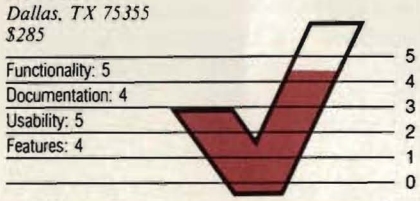
After you leave the city, things get worse. A barrage of jet aircraft, tanks, mines, Zeppelins, submarines, and missiles constantly rains down on you. You do have some support. Your superiors occasionally send a weapons transport to supply you with additional firepower. Your vehicle can carry blasters, missiles, rear shields, and a force field of invincibility.

Action Fighter combines road racing excitement and shoot-'em-up action into a unique arcade challenge. The graphics and sound are very good, and the gameplay is excellent. If you're looking for a hot new arcade game with a little variety, buy this game. It's a lot of fun.

—*T.T.*

M2Sprint

M2S
P.O. Box 550279
Dallas, TX 75355
$285



M2Sprint is the latest Amiga compiler. This Modula-2 compiler is a beauty, and it's extremely fast. Compile, link, and run programs in seconds, not minutes. The code it produces is competitive with that of many C compilers. Best of all, it has the most versatile of Amiga programming environments. Edit, compile, link, and run from the CLI, the Workbench, or the editor.

The integrated editor is a story in itself. It automatically uppercases reserved words. It can be set to complete words for you. (Tired of typing BltMaskBitMapRastPort?) All that and it's fast, too. Maybe one of the reasons *M2Sprint* is my favorite compiler is because its editor is my favorite editor.

This package gives you nearly everything: simple modules for screens, windows, menus, and more; *ARexx* and ARP modules; C language modules; professional documentation; a profiler; source code for all modules; IFF modules; and a demo disk.

Although the package includes a debugger, it is not a source-level debugger. Expect one of these and more in the next major update. Another shortcoming that needs to be rectified is an interface for linking C and assembly language modules.

I recommend this programming system.

—*R.A.* ▷

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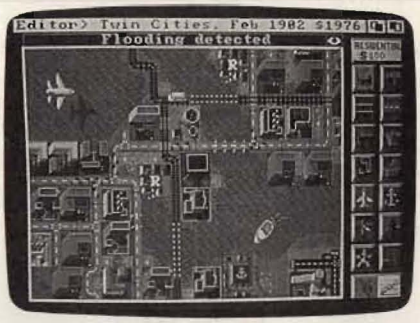
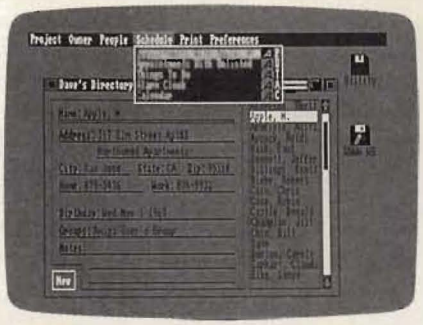


SimCity



Who! What! When! Where!

SimCity

Maxis
953 Mountain View Dr.
Suite 113
Lafayette, CA 94549
$44.95

Flight simulators, sub simulators, driving simulators, and now a city simulator. A city simulator? Five hours after initially booting the disk, I decided that *SimCity* wasn't as strange as it first sounded and that I'd better get to bed since it was 3:00 a.m.

If you've ever grumbled that you could run the country better than the guys in office, Maxis' *SimCity* could change your mind. It puts you squarely in the shoes of a city planner/mayor, and—boy!—do you have some obstacles to face.

You can start from scratch and design your own city or try your hand at managing one of the prebuilt cities included with the game. While it's a challenge to start a city from scratch, managing an already existing city is no snap when you have to contend with crime in Detroit, Allied bombing in Hamburg, or Godzilla in Tokyo.

You start with a fixed amount of money and must use it to develop residential, commercial, and industrial property. Use the mouse and a set of icons to lay out your initial city area. As the city grows, you'll have to contend with crime, pollution, traffic, unemployment, housing costs, and that most critical factor of all: your approval rating.

You can almost sympathize with real politicians when the Sims (city residents) demand a stadium be built and then nearly impeach you because you had to raise taxes to generate the funds needed for construction.

Of course, if the Sims really get on your nerves and you're almost out of office anyway, you can have some fun by causing one of five different natural disasters to occur within the city. If they thought they had it bad before, imagine how they'll feel after a giant monster terrorizes town during a 9.0 earthquake!

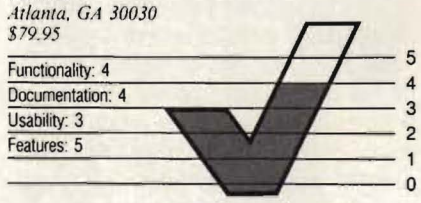
SimCity multitasks well, and it can be installed on a hard disk (although you must use the floppy as a key disk). Graphics are well done, and, while they can take advantage of the 64-color Extra Half-Brite mode, they still look good on a Half-Brite-less Amiga 1000.

The excellent 51-page manual concludes with an 11-page history of cities and city planning that gives some good advice on city management. If I'd read it before I played the game, I might have realized that it wasn't such a good idea to build a nuclear plant in the center of downtown Kimsboro.

—D.A.

Who! What! When! Where!

Blue Ribbon Bakery
1248 Clairmont Rd.
Suite 3D
Atlanta, GA 30030
$79.95



After you use *Who! What! When! Where! (WWWW)*, your life may never be the same. This may be a scary thought to some, but the folks at Blue Ribbon Bakery want to make things easier for you.

WWWW is a powerful scheduling program with plenty of extras. If you don't have a private secretary to remind you of appointments, meetings, and important dates, *WWWW* may be the answer.

In addition to the appointment scheduler, you'll find many other helpful features. The things-to-do menu helps you organize daily tasks, the calendar allows you to see a month at a glance and plan ahead, and the alarm clock is always ready to alert you with a voice, bell, sound effect, and/or screen flash. Unlike some secretaries, an optional password keeps your business a secret from others. The abundance of options in *WWWW* is its strong suit.

One powerful option is the directory database. Here you can keep track of all the significant people in your life, listing names, addresses, phone numbers, and notes on each. Add the ability to autodial, categorize people into relevant groups, and search in practically any way imaginable, and you have a complete personal organizer.

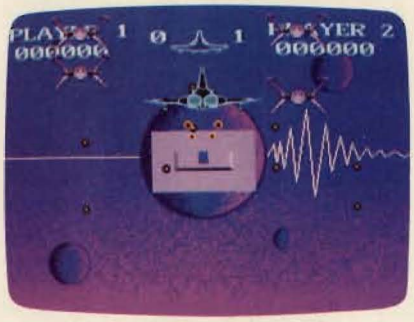
As with any productivity software, *WWWW* does have its drawbacks. You'll encounter the first when you buy it: $79.95. That is a lot of money for any software, and for that price I can think of other programs I'd rather buy.

Another nuisance is the copy protection. Approximately once a week, *WWWW* asks you to type in a specific word from the manual. Almost everyone is versed on the negative aspects of software piracy, but protecting this type of product is almost unforgivable.

As a solution, Blue Ribbon Bakery will send you an unprotected version for an additional $10.

If you're the type of person who could benefit from a scheduler and can afford the price, I highly recommend you try *WWWW*. After getting organized, you'll have more time to do other things. And we all know time is money.

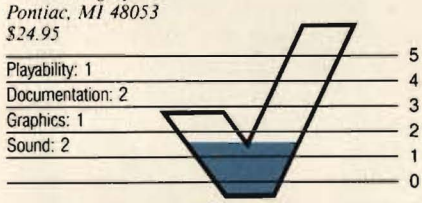
—D.H.



Slip Stream

Slip Stream

Microdeal
576 S. Telegraph
Pontiac, MI 48053
$24.95



"Wood ruck, commander," the computer ejects in a female tone, just before dropping your Emerald Fighter from what is best descibed as a burlap mothership. Fortunately, you can skip this launch from the great gunnysack by pressing your joystick's fire button—a manuever that I highly recommend.

Gameplay can be summed up like so: Dodge obstacles and enemy fire, shoot everything, and destroy the power crystal. Do this nine times.

Your ship remains in the center of the screen when you move horizontally. Only the approaching objects shift left and right. And because you must stay within the "slip stream," you can only move so far in any direction. As a result, only a small portion of the screen is used for gameplay. The rest contains a well-drawn but drab background picture that changes only when you advance in levels.

It's difficult to control a ship with such limited movement. Even when I thought I had the knack, I was often destroyed by enemy fire that I was sure had passed by my craft. These two things made the game both frustrating and difficult to play.

The four-page manual is sufficient (not much to document here), but it erroneously instructs you to insert the master disk into drive DH0 to load the game.

I have yet to destroy all nine power crystals, but after fighting nearly 15 rounds of *Slip Stream*, I don't want to.

—R.T. ▷

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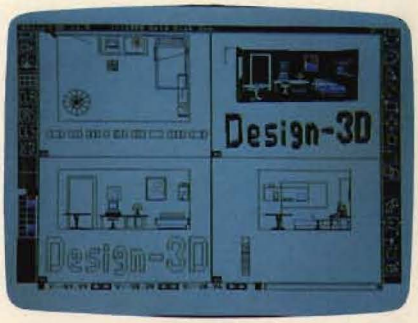
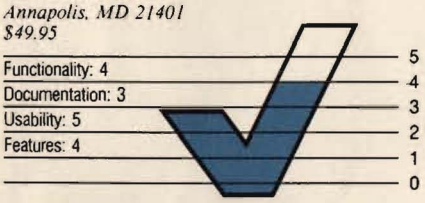
Datastorm



Design 3-D

Virus Infection Protection

Discovery Software International
163 Conduit St.
Annapolis, MD 21401
$49.95



Virus Infection Protection is a vaccine against Amiga computer viruses. It inoculates uninfected disks against invasion by copying the disk's vulnerable boot block—where all Amiga viruses do their dirty work—to a protected file.

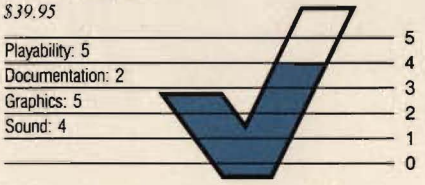
If a virus invades the disk and copies itself to the boot block, *VIP* alerts you and replaces the infected block with a copy of the original boot from the protected file, eliminating the virus. *VIP* will not, however, cure an already infected disk that hasn't been treated with *VIP* in advance. *VIP* can only be used as prevention—but that, after all, is the best way to handle any disease. Used correctly, it is currently effective against known Amiga viruses.

The program is simple to use, with a full Intuition interface, and—a rarity for any program—versions in five languages. Discovery Software even provides little stickers to mark your protected disks. Frankly, if you do any downloading of software from a BBS or online service, or if you swap disks with people who do, you need this program. You should definitely take the time to inoculate your hard disk and backups with *VIP*. Even if you never encounter an Amiga virus, you'll breathe easier.

—*S.A.*

Datastorm

Visionary Design Technologies
45 Whitehorn Crescent
North York, Ont.
Canada M2J 3B1
$39.95



Here's the game I've been waiting for. *Datastorm* brings my favorite arcade era (circa 1982) to my Amiga.

Datastorm is pure shoot-'em-up of the *Defender* variety. Think of it as *Defender* gone berserk. In fact, it's so much like that popular Williams coin-op game that I searched through the documentation for a notice that *Datastorm* was based on *Defender* and carried the Williams seal of approval, but to no avail. Seems like a potential lawsuit to me.

Datastorm is better than *Defender*, though. The interaction between the elements of the game is more complex. You must carry small pods into a warp gate, but standing in your way is an incredible collection of enemies, including a giant space squid and a deadly skull. Keep one eye on your pods and another on the enemies.

For perhaps the first time, the Amiga really looks like a state-of-the-art stand-up arcade system. I've spent more time with this game than with any other Amiga game except *Tetris*.

Two-player mode is interesting, but the game is much better as a one-player game. And, by the way, be sure to switch into D (for *Defender?*) mode before play. That will give you more room to shoot.

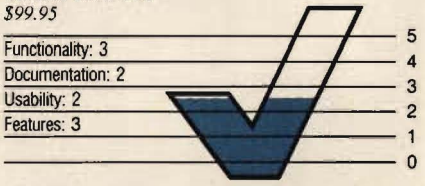
My chief complaints with this game are the long loading time and the dull pictures you are forced to view before and after the first game. The copy protection is pretty severe also. I've already had one disk go bad, so consider buying the $10 back-up disk.

Buy this game if you want to face incredible odds. And, as the box says, "Blow 'em to Bits!"

—*R.A.*

Design 3-D

Gold Disk
P.O. Box 789
Streetsville, Mississauga, Ont.
Canada L5M 2C2
$99.95



Like all pioneers, early Amiga animators had it rough. While there were some good animation programs on the market, they practically forced you to use graph paper to design your objects—kind of like using an abacus as an adjunct to your spreadsheet.

But now we have programs like Gold Disk's *Design 3-D*, a sophisticated image-creation and editing program with basic animation capabilities.

Creating graphics with *Design 3-D* is a breeze. Create objects in 16 colors using the polygon, rectangle, ellipse, and arc tools. Then use Clone, Connect, and Spin to extrude your cre-

ation into the third dimension. The user interface is well designed, allowing all functions to be easily selected with the mouse.

You can also add 3-D text to your graphic creations. *Design 3-D* even includes a built-in 3-D font editor, in case the included font doesn't fit your needs.

When your object is complete, you can render it as a solid object and even create a rudimentary animation with it. However, the rendering and animation capabilities are fairly basic and are most useful for previewing the objects before loading them into more sophisticated animation or ray-tracing programs.

Unfortunately, *Design 3-D* has some poorly implemented features that detract from its usability. The program continuously makes its own window active, hampering multitasking. Because of this, you must exit the program if you want to work with another animation program. When you go back to load *Design 3-D,* you have to face its "type a word from the manual" copy-protection each time. While this type of protection is tolerable with games, it bogs down productivity software, especially because you'll often reload the program many times during a work session.

Also, while *Design 3-D* will import and export *VideoScape 3-D* files, it brings them in upside down and backward. It's disconcerting to try to edit a car that's resting on its roof. You can rotate objects, but it takes a lot of trial and error to turn them over precisely.

Since most people will be using *Design 3-D* in conjunction with *VideoScape* or one of the ray-tracing animation packages (using Syndesis' *Interchange* to convert the files), I can't really recommend this program until its problems are fixed.

—*D.A.*

Designasaurus

Britannica Software
345 Fourth St.
San Francisco, CA 94107
(415) 546-1866
$49.95

Have you ever wanted a dinosaur in the den? Wait no longer. *Designasaurus,* from Britannica Software, is an educational program that brings you a whole houseful of dinosaurs. It's educational—and fun.

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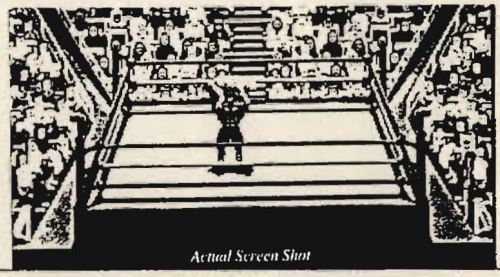
ICW
(For the Amiga)



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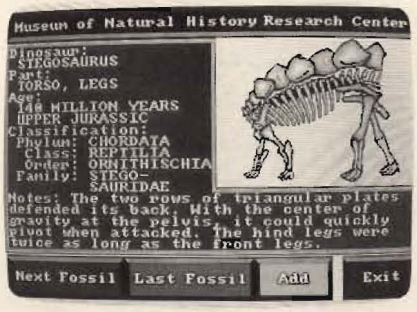


Designasaurus

Fright Night

sonalized certificate of completion. Play action may seem too simplistic to adults, but my resident expert says it's about right for kids.

After walking a dinosaur, why not build one of your own? Build-a-Dinosaur takes you into the Museum of Natural History, where an animated male scientist ("Daddy, can't girls be scientists when they grow up?") leads you to a cabinet full of fossilized bones. You pick a drawer, the scientist kicks the cabinet, and—*zing!*—the drawer pops open.

Mix and match heads, bodies, and tails to create the dinosaur of your dreams. You even get to name your creature (Amigasaurus, anyone?) and print it on paper or on the included iron-on T-shirt transfer sheet. Don't worry, parents. Additional transfer sheets are available.

The third option, Print-a-Dinosaur, lets you create regular- or poster-sized printouts (as well as iron-on transfers) of various built-in dinosaur pictures. Young children especially enjoy these printouts, which allow them to create their own dinosaur coloring books or posters for their walls.

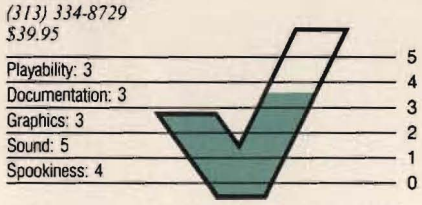
The Amiga edition of *Designasaurus* will appeal to children, its primary audience. Encounters with predators have been toned down from previous versions—good news for kids who don't like blood on the screen.

Now, says my daughter, if we could just make that scientist a girl. . . .

—*S.H.*

Fright Night

Microdeal
576 S. Telegraph
Pontiac, MI 48053
(313) 334-8729
$39.95



"Velcome to *Fright Night*." The digitized speech and the spooky music that introduce this game send chills down my spine.

Fright Night is a game (evidently based on a movie I missed) that puts you in the place of a vampire. That place is a coffin. And every night you come out of that coffin to do away with the no-good loiterers who stand around—for no reason that I can fathom—in your castle.

These mortals are merciless. They toss unsavory herbs and cursed crosses at you. Dodge these missiles and make a meal of each intruder. After a while, ghosts appear. Don't let them touch you; they'll do significant damage.

The musical score is well above average. The graphics are attractive, but once in a blue moon the animation is marred by a gruesome glitch.

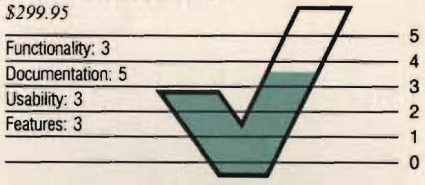
As the night wears on, you'll progress from a devilishly handsome rogue to a skeleton. You must feed on flesh to regain your health. If you turn into 100-percent bone, you've had it—you're dust.

I confess that I have a perverse pleasure in playing this game (even though it becomes repetitive fairly quickly), but my wife, an avowed vegetarian, can't bear to witness the carnage. Rate this game PG-13 for the violence and the upper-body nudity of the female ghouls.

—*R.A.*

The Works! Platinum Edition

Micro-Systems Software
12798 W. Forest Hill Blvd.
Suite 202
W. Palm Beach, FL 33414
$299.95



The box that *The Works! Platinum Edition* comes in says the package is "integration . . . *refined!*" Well, it *should* be refined, considering most of the programs included with the package have been around since 1986.

The Works! Platinum Edition is an integrated software package made up of enhanced versions of Micro-Systems Software's *Scribble!, Online!, Organize!, Analyze!,* and *Flipside!* programs. Billed as a starter kit, *The Works! Platinum Edition* ties the programs together with clipboard support and a common user interface.

Unfortunately, the integration is not as complete as it could be, and some of the modules show their age. That's not to say they aren't useful; they just don't hold up to more recent software in ease of use.

The weakest module in the bunch

is the word processor. The feature list sounds impressive: a 104,000-word spelling checker, a 470,000-word thesaurus, mail merge, and graphics support. However, most of these sophisticated features are controlled by *WordStar*-like dot commands, even graphics insertion. While graphics don't show onscreen (all you see is the dot command), they do print well as long as you don't use HAM pictures.

The Works! Platinum Edition includes a flat-file database that is file-compatible with *dBase III*. However, it's far from a *dBase* clone. It's not relational, and it doesn't have the graphics support included with many other Amiga databases. Still, it is a satisfactory program for maintaining mailing lists for the word processing module. One nice feature is math support rivaling that of the spreadsheet module.

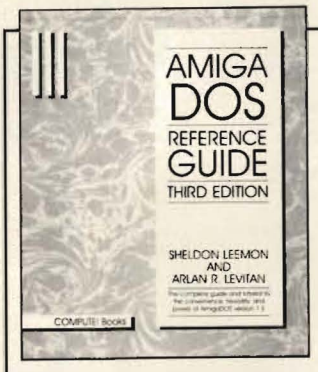
The spreadsheet is the best module in the bunch. It includes macros, eight-color hot-linked graphing, and 68881 coprocessor support; it also can import and export *Lotus 1-2-3* 1.0 WKS files. Graphs range from simple pie charts to fully three-dimensional bar graphs that can be rotated on all three axes. Graphs and spreadsheets can be printed with the sideways printing module. The spreadsheet is fast, powerful, and clipboard-compatible; about the only feature you'll miss is the ability to transfer files with more recent versions of *Lotus*.

A close runner-up to the spreadsheet is the telecommunications module. It can emulate an IBM ANSI terminal, so you can see all the neat character graphics screens on your local BBS. Besides a complete scripting language, 20 function keys, and a review buffer, the module also includes every major file-transfer protocol. The neatest feature is MSS's SADIE protocol, which lets you send and receive files simultaneously, while typing in chat mode with the person on the other end!

The modules are integrated using the Amiga clipboard. While this makes it easy to transfer basic text data between modules, it doesn't allow for hot links. A better system would allow you, for example, to use the spreadsheet to update numerical data you've imported into the word processing module. As it stands, you'll have to retype or reimport any changes you make in other modules.

If MSS would replace the word processing module with their *excellence!* program and beef up the package's integration, *The Works! Platinum Edition* would be a must-have. As it stands, you're better off buying *Analyze!* and *Online!* for spreadsheets and telecommunications and looking elsewhere for a word processor and database.

—D.A. ▷



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Circle Reader Service Number 162

Shōgun

Distributed by Mediagenic
3885 Bohannon Dr.
Menlo Park, CA 94025
$59.95

OK, miniseries fans, turn back the clock to 1600. Change your name to John Blackthorne, pilot-major of the trader-warship Erasmus. Set your sails for feudal Japan, and enter the world of James Clavell's *Shōgun,* now an interactive adventure from Infocom.

Shōgun combines vivid graphics with a traditional text adventure (no audio, which accounts for the program's low sound rating). As noted on the *Shōgun* box, it's "true to the original" where language, violence, and such are concerned. Thus, it may not be the game of choice for children.

Shōgun's screens are well done. The left part of the screen is reserved for the text window, where you and the program interact. The rest is devoted to graphics—first-rate illustrations, accurately done in the style of sixteenth-century Japanese court painters—that illustrate the adventure as it unfolds. Give these images heed; they may trigger useful insights. The rich graphics and detailed text make an effective combination.

You won't solve *Shōgun* in one sitting. Just to survive, you'll have to challenge your most basic Western beliefs and assumptions—not the least of which is when to use your sword. You have to learn the rules of a land where manners are paramount and honor is valued above all.

Purists may object to the presence of pictures in what is essentially a text adventure. This genre, they say, should be like the novel itself, with illustrations only in the mind's eye. But suspend judgment until you've experienced *Shōgun.* It may change the way you see interactive fiction.

—*S.H.*

Anti-Virus

DevWare
10474 Rancho Carmel Dr.
Rancho Bernardo, CA 92128
$39.95

Anti-Virus is another useful Amiga virus vaccine program. Actually, it is a set of utilities to help you protect uninfected disks, diagnose the presence of a virus on infected disks, and restore health to sick ones. As with any such program, it is best used *before* your disks are infected, prevention being the best cure.

The basic installation program for *Anti-Virus* is vInstall. It alerts you to the presence of a virus in the boot block of the startup disk—where virtually all Amiga viruses reside—by displaying a picture about one second after startup. If the picture is corrupted or doesn't appear, the disk probably is infected.

The vCheck program monitors each disk as it is inserted into your system, and it alerts you if the boot block of that disk is not a standard AmigaDOS block or one of the *Anti-Virus* blocks. You can cure infected disks by writing a new boot block over the infected one.

For protecting games and other programs that use nonstandard boot blocks, use vCat. vCat saves any uninfected boot block to a separate catalog disk and then restores it to the original disk in case of infection.

Eradicate a virus from memory without doing a cold reboot (switching off the computer) by running vReboot. Two additional utilities—vDump, a CLI program to view the hex and ASCII contents of a disk's boot block, and vTrojan, an anti-Trojan Horse program—provide additional protection.

Anti-Virus should be included in your computer pharmacopoeia. While it is not as simple to use as some other programs, it offers more protection.

—*S.A.* ▲

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ON DISK

Your Guide to This Issue's Programs

Amiga Resource
Volume 1, Number 4
October 1989

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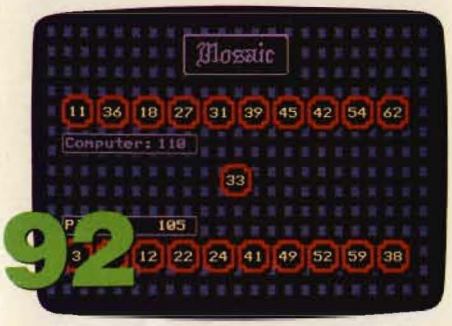

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Rejection

Rhett Anderson and Tim Midkiff

In a gargantuan stadium, riding on a cushion of air, two players face off in the exhilarating game of "Rejection." The two opponents, seated in saucer-shaped pods equipped with pulsating magnetic fields, play a high-tech version of hockey. It's a brutal game, mastered only by those with the quickest minds and the truest reflexes. If you feel up to the challenge, strap on a helmet and run Rejection.

At the Controls

Although your pod's controls are rudimentary, the pods themselves are capable of an infinite variety of maneuvers under the guidance of a practiced player. A pod has four rocket thrusters, each designed to propel the pod in a different cardinal direction. Thus, eight different directions can be chosen, depending on the direction in which the joystick is pressed. Since the pods are massive and the game is played on a nearly frictionless surface, the pods continue in their paths long after the thruster controls have been released. By carefully firing the correct thrusters in sequence, movement in any arbitrary direction is possible.

Because of the momentum factor, it may take you some time to become accustomed to the game. Although friction will eventually bring your craft to a crawl if you leave all thrusters off, you'll want to practice stopping at a given location. To brake, thrust in the direction opposite your motion.

Your pod continues traveling in the same direction until you use the thrusters, hit the other player, or hit a wall. It's not possible to hit the metal ball because your pods are floating on a cushion of air and the ball is rolling on the floor. In fact, the ball will often roll underneath you.

As if getting around the playing field weren't different enough, you must also keep your mind on the objective of the game: scoring enough goals to be declared the victor. Your ship emits a pseudomagnetic field that affects a ball-shaped puck. Normally, the ball is repelled by this field, but if you press your joystick's fire button, the ball will be attracted instead. Remember, while you're trying to score, your opponent is, too. Both players' fields affect the ball. The forces in this game follow the inverse square law that applies to forces like gravity and magnetism: The closer you are to the ball, the more the field pushes or pulls it.

Your First Game

Rejection is found in its own drawer on the *Resource Disk*. Simply open the folder icon and then double click the Rejection icon. If you wish to copy the program to another disk, you must copy the entire drawer. You must have at least one joystick to play the game. You'll need two joysticks if you want to play against a friend.

When the first menu appears, you'll be asked to choose whether you want a human or computer to play the left player (the one who tries to score through the goal on the right). The joystick in port 0 (the mouse port) controls the left player. Use the joystick plugged into port 1 to make your selection and then press the fire button. Next you'll be asked to choose whether you want a human or computer player to take the controls of the right pod (joystick in port 1). Finally, you'll be asked if you want to play to 7, 10, or 15 goals. If you want to see a demonstration game before you begin playing, let the computer play both sides.

You may pause the game during play by pressing the space bar. Press the Enter key to continue. Press Esc to exit the current game and return to the menu.

Tricks of the Trade

Experienced Rejection players all have their favorite ways of scoring, but to help you get your bearings, we have provided a few tricks that the top players have grudgingly given up.

- The simplest way to score is to drag the ball to your opponent's goal and release it. To do this, you must first learn how to carry the ball. Hold down your joystick button and approach the ball. As long as you keep the button pressed and keep your speed down, you should be able to carry the ball with you as you move.
- If your opponent's pod is headed toward the goal to score, slam into it as fast as you can. It will fly away and you'll be left holding the ball.
- Remember to allow for momentum: If you get going too fast, you probably won't be able to slow down in time to counter your opponent's offensive moves.

SPECS

Rejection
PROGRAM SIZE: 24,156 bytes
SUPPORT FILES
  NOISE1.SAMPLE: 2346 bytes
  NOISE2.SAMPLE: 1506 bytes
  NOISE3.SAMPLE: 2076 bytes
  OMINOUS.SAMPLE: 21,808 bytes
  RJTBACK: 29,922 bytes
  RJTSHAPES: 15,688 bytes
MINIMUM CONFIGURATION
  512K RAM
  AmigaDOS 1.2
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  Workbench
    Double-click icon
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    RUN REJECTION

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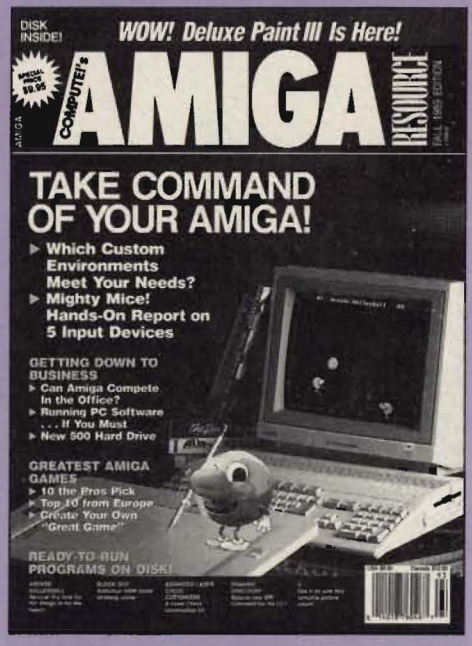

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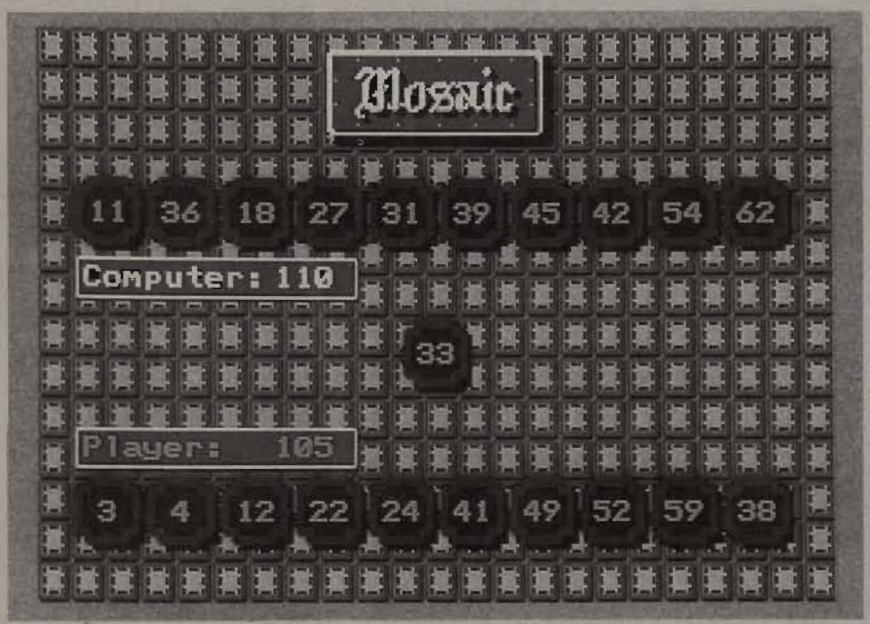
Mosaic

Jay A. Reeve
Amiga Version by Troy Tucker

The Sultan has called you, his most famous artisan, to his chambers. This isn't especially surprising, as you're known throughout the land as the most talented creator of mosaics.

"Dear friend," the Sultan says, "your mosaics grace every room in my palace. However, my wizards and accountants have devised a machine which they claim can lay tile even better than you."



The Sultan has decided that a contest is in order. Turn for turn, you and the new machine will place tiles, and the first one to create an aesthetically pleasing mosaic shall be declared the Sultan's official artisan.

You'd better win—you never did get around to learning any other trades.

"Mosaic" is a strategy game you can play against the computer. Your goal is to place numbered tiles in order before your opponent does. Although the rules are easy to learn, you won't find the game easy to win. The wizards and accountants have created a truly ruthless machine.

Man vs. Machine

To play Mosaic, boot your Amiga with the *Resource Disk*, double-click the disk icon, open the Mosaic folder, and double-click the game's icon. A numbered tile appears, sliding across a colorfully patterned game screen.

There are 64 tiles, numbered 1–64. Players are dealt 10 of the tiles randomly at the beginning of each game. The computer's tiles appear at the top of the screen; yours appear at the bottom.

When it's your turn, your score (which appears after the word *Player*) is highlighted in yellow and a new tile moves in from the left of the screen. If you wish to use this tile, click the tile on the bottom of the screen that you want to replace. If you would rather try for a better one, click the tile that appears in the middle of the screen and a new one will slide into its place. If you click the middle tile again, you forfeit your turn.

When you replace a tile, the one you trade in will be moved to the center of the screen. The next player can use that tile if desired. Be careful that you don't trade in a tile that the computer can use to win the game.

A round ends when all of a player's tiles are in order. Starting with the leftmost tile, the loser of the round gets 5 points for every tile that appears in numeric order. The winner of the round gains 50 points, 5 points for each of the ten tiles. The first player to reach 500 points wins the game. Press the left mouse button to begin a new round. The loser of the previous round gets to move first.

Play Again?

Mosaic has a pull-down menu with three options: New Game, New Tiles, and Quit. The New Game option zeroes out both players' scores and begins a new game. The New Tiles option retains the scores but begins a new round by dealing a whole new set of tiles. Quit exits the program.

SPECS

Mosaic
PROGRAM SIZE: 19,372 bytes
MINIMUM CONFIGURATION
  512K RAM
  AmigaDOS 1.2
ENVIRONMENT
  Workbench
    Double-click icon
  CLI
    RUN MOSAIC

Macro Keys

Mike Duppong

"Macro Keys" is for people who are tired of typing. It's a short utility that allows you to assign a word, a sentence, a phrase, a CLI command, or a series of commands to any one of the Amiga's ten function keys. Just press a key and your predefined string of characters is automatically typed to the screen.

CLI users can redefine the function keys to execute their favorite commands, such as DIR, COPY, DELETE, or ENDCLI. Modem users can assign log-on sequences and frequently used access commands to their function keys. And programmers should appreciate Macro Keys' ability to duplicate long compile instructions like *ln +q −g −o alc advlaser.o advtitle.o advsound.o advgraph.o advdoor.o adviff.o −lc* with a single keypress.

Macro Keys isn't limited to the CLI—it works with many commercial and public domain programs, including *Diga!, Access!, ProWrite* (function keys F6–F10 only), *MicroEMACS*, and others. Try Macro Keys with the programs that you use.

Designing Macros

To use the program, double-click the Macro Keys icon or enter RUN MACROKEYS from the CLI. You can create up to 40 separate function-key definitions: 10 for the function keys by themselves and the rest for their CTRL-, SHIFT-, and ALT-key combinations. Each definition may contain as many as 100 characters.

Defining a function-key macro is easy. Simply click the Macro Keys window to activate it and press the desired function key, with or without the CTRL, SHIFT, or ALT key held down. If this key has any characters assigned to it, they will appear in the window. Using the Amiga's standard editing keys—cursor left, cursor right, BACKSPACE, DELETE, and so on—you may enter a new sequence of characters. Press ENTER when you've finished.

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You can simulate the ENTER key in your function-key definitions with the vertical bar character (|). Any number of these characters may be used. As a result, it's possible to generate several commands with one function-key macro. For example, you could define F3 to enter the three CLI commands SAY COMPILING|EXECUTE COMPILE|SAY FINISHED|.

To test your macros, open a CLI window, click in the window to activate it, and press any predefined function key. The text assigned to that key should appear in the CLI.

Menu Options

Macro Keys offers several options in its pull-down menu: On/Off, Clear, Load, Save, Help, and About.

On/Off enables and disables the function-key macros without exiting the program. Macro Keys' current on/off state appears in the title bar of the program's window. There are some situations in which you'll want Macro Keys turned off. For example, *DeluxePaint II* allows you to access certain program features via the function keys. If a macro has been assigned to one of these keys, Macro Keys will interfere with the normal operation of *DeluxePaint II*. By turning off Macro Keys, you can avoid this problem.

Another, somewhat drastic way to disable the function keys is to clear all their definitions with the program's Clear option. When you select Clear, the program asks whether you're sure. Click Yes to clear or No to abort. Clear comes in handy when you're designing an entirely new set of function keys and wish to start from scratch.

To accommodate more than one set of function-key definitions, Macro Keys allows you to load and save your macros to disk. You might use one set of definitions for programming and another for word pro-

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cessing. To save a set of function-key macros, select Save from the pull-down menu, enter a filename in Macro Keys' window, and press ENTER. The most recently entered filename appears in the window as the default filename. Use the DELETE key or press Right Amiga–X if you wish to erase it. To load a previously saved set of function-key definitions, simply select the Load option, enter a filename, and press ENTER. To abort either the Load or the Save option, erase the filename from the window and press ENTER.

When Macro Keys is first run, it automatically loads the file named default.macros found in the same drawer (directory) from which the program has been run. To make your function-key definitions the default, save them using the filename default.macros.

The Help option provides instructions on how to define a function-key macro. Selecting About displays information about the program and its author. To exit the program altogether, click Macro Key's close box.

How It Works

Macro Keys' operation relies on a custom input handler—a very intriguing and extremely useful feature of the Amiga's operating system.

The main Macro Keys program actually sleeps most of the time. It awakens for a short period when the user enters a function-key definition or selects a menu item. Macro Keys' custom input handler also awakens the main program when a function key is detected in the Amiga's input event stream. When this happens, Macro Keys looks through its definition table to see whether anything has been defined for the pressed key. If nothing has been defined for that key, Macro Keys simply goes back to sleep. Otherwise, it immediately goes to work on building an event chain.

The event chain consists of input event structures which simulate the pressing and releasing of each key found within the function-key macro. Once this is completed, Macro Keys informs its custom input handler and goes back to sleep. The input handler takes the newly constructed event chain and places it into the input event stream. To the Amiga and most of its programs, it looks exactly as if someone has just entered these characters from the keyboard.

For more details on the program's inner workings, refer to the program's source code, found on this issue's magazine disk.

SPECS

Macro Keys
PROGRAM SIZE: 13,980 bytes
MINIMUM CONFIGURATION:
  512K RAM
  AmigaDOS 1.2
ENVIRONMENT:
  Workbench
    Double-click icon
  CLI
    RUN MACROKEYS

Snap!Plus

Rhett Anderson

If you would like to capture images from your favorite game, graphics program, or application, "Snap!Plus" is the tool you need. Like competing commercial screen-grabbing programs, Snap!Plus can capture virtually any screen, including HAM, EHB, and overscan screens. Unlike most of its competition, however, Snap!Plus can grab screens while you have menus pulled down or gadgets selected. And it has the simplest

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interface of all such programs.

Even if you don't need to grab screens, Snap!Plus is still nice to have around. It lets you flip between all Intuition screens with a keypress—a must for serious multitaskers.

Snap!Plus runs from the CLI or the Workbench. It waits in memory for a special keypress combination. When you have the screen just the way you want it, press Left Amiga–S, type in a filename, and then press Enter. Your picture will be saved to the file you indicated. If you decide not to save the screen, just click on the Quit gadget.

To start Snap!Plus, double-click on the program's icon. If you'd rather use the CLI (or place Snap!Plus in your startup-sequence), enter the command RUN >NIL: <NIL: SNAP!PLUS.

There are four keypress combinations that you'll need to learn.

Left Amiga–M. Bring up the next Intuition screen. Keep pressing the key until the screen you desire appears.

Left Amiga–S. Take a snapshot of a screen. This command brings up a special window. Type in the filename with which you want to save the screen. Be sure to specify a complete pathname like RAM:TESTPIC, DF0:HOUSE, DF1:DOG, or DH0:PICTURES/FISH. If there is enough memory available, Snap!Plus will make an instantaneous copy of the screen to freeze any motion and then save the copy to disk. Otherwise, Snap!Plus will save the screen memory to disk directly. If you are low on memory, avoid saving the screen to the ramdisk. Instead, save it to a floppy or hard drive. After the file has been written out, the screen flashes. If the screen does not flash, either you have failed to specify a valid filename or you had insufficient memory for the operation.

Left Amiga–D. Take a snapshot of a screen with a delay. Use this keypress combination instead of Left Amiga–S when you wish to have a few seconds before the snapshot is made. This option is especially useful for capturing a screen while a menu is pulled down.

Left Amiga–Ctrl–C. Exit Snap!Plus. Press this key combination when you wish to disable Snap!Plus and release the memory it uses.

Using the Program

If you'd like Snap!Plus to save an icon along with the picture it saves, copy the snap_icon.info file from the s directory of the *Resource Disk* to your s: directory. Use this command from the CLI:

```
copy Resource3:s/snap_icon.info s:
```

Because Snap!Plus is based on Intuition screens, it will not properly capture displays made up of two or more Intuition screens. Also, Snap!Plus will not capture the sprite pointer or any other sprites that may appear on the screen. ▲

SPECS

Snap!Plus
PROGRAM SIZE: 17,072 bytes
SUPPORT FILES
  S:SNAP_ICON.INFO: 800 bytes
MINIMUM CONFIGURATION
  512K RAM
  AmigaDOS 1.2
ENVIRONMENT
  Workbench
    Double-click icon
  CLI
    RUN >NIL: <NIL: SNAP!PLUS

Disk Update

Here's where to turn for bug fixes, operating notes, and update news for the programs on COMPUTE!'s Amiga Resource Disk. *Readers experiencing difficulty with a disk should first read "How to Use the Disk," found in every issue of* Amiga Resource. *If you're still having trouble, write us (see the section "Where to Write" in "Readers Feedback").*

Summer 1989 Issue

If you followed the instructions for unpacking *Uedit* and couldn't find the UES icon, don't panic. The program and the icon are there, they just unpacked about a mile and a half to the right of the window. Use the horizontal scroll bar to move the window view to the right and you'll see it. Also, *Uedit* has been revised since our publication. Registered owners can receive the update from the author.

For those of you who have tried to modify the shapes picture in "Advanced Laser Chess" without any luck, we apologize. The article incorrectly states that you can use *DeluxePaint* or another paint program to modify the picture. You must use *DeluxePaint II.* Also, the article says that the file is called ALC_PIECE.PIC when it is actually called ALC_PIECES.PIC.

Also regarding Advanced Laser Chess, if you wish to load a saved game (or a customized game created with "Advanced Laser Chess Customizer"), you must type in the full pathname of the file—for example, DF0:LASERCHESS/MYGAME.

Fall 1989 Issue

For your convenience, we've added a ramdisk and the diskcopy command to the *Resource Disk.* This should alleviate most of the headaches involved in making a backup of our disk. Just drag the *Resource Disk* icon onto the icon of a blank disk.

"Arcade Volleyball" experiences a few sprite problems when used with early versions of Workbench 1.2. We're not exactly sure what causes the problem, but it can be avoided if you boot with the *Resource Disk* before playing the game.

The "Advanced Laser Chess Customizer" article incorrectly refers to a SETUPS drawer. Due to space limitations, we were unable to create this drawer on the *Resource Disk.* All of the "Advanced Laser Chess" setups may be found in the ALC-Custom drawer (these files do not have icons).

ClickDOS has been upgraded since our publication. The current version is *ClickDOS V2.06.* You can register with the author for additional information. The address is in the documentation found on the disk.

—Troy Tucker

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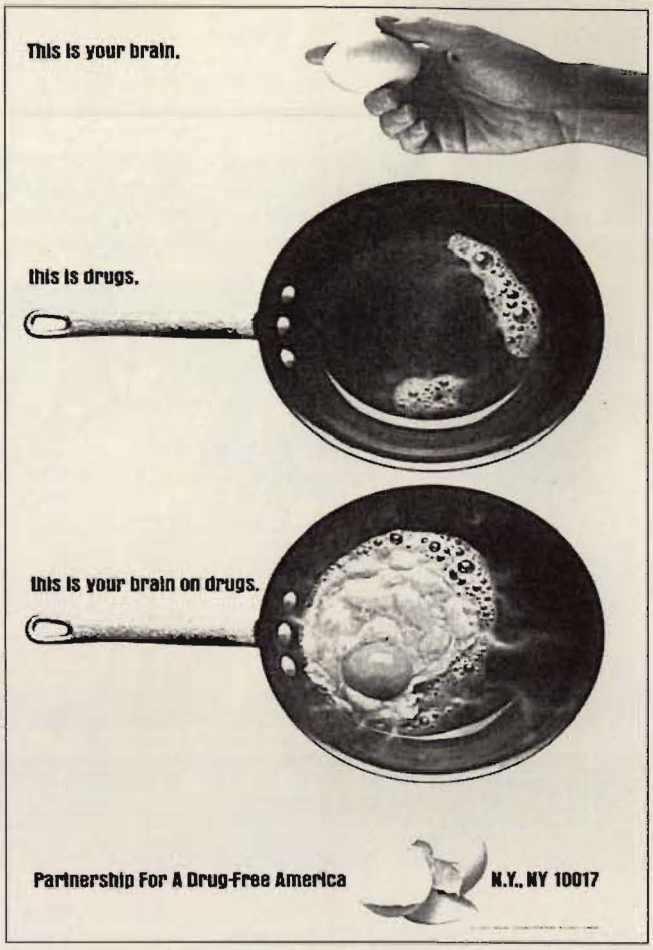

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This months selection -

DD17: RAYTRACING - Learn about raytracing the inexpensive way; DBWRender - Ray tracing, RayTracedPics, C source included.

DD21: DATABASE - This disk contains a good CLI based database program, additional programs on this disk include, Arc (023) - a file compresion utility, Newzap3 - a binary file editor , PDMake and others.

DD24: PRINTER DRIVERS - Contains over 40 different printer drivers, also contains a hard disk backup program and others.

DD26: Printer Driver and CAD - This disk contains MCAD (1.2.5) an excellent computer aided design program, also on this disk is a program that generates printer drivers for those hard to use printers.

DD44: ARP and DiskSalv - On this disk you will find the complete ArpRel3.0 This is the official AmigaDOS Resource Project (ARP) release 1.3. ARP makes many improvements to AmigaDOS and makes your system easier to use from the CLI. If you have AmigaDOS 1.2 or 1.3 you should get ARP (see dd45), and DiskSalv - "DiskSalv V1.3 is a disk recovery program. DiskSalv will scan a bad disk volume for anything that can be recovered, and will restore these items to any AmigaDOS volume. It does not make any attempt to fix the bad device in place. Many other useful utilities are provided.

DD45: AREXX PROGRAMS - This disk contains several useful arexx programs and examples (rumor has it that arexx will be provided free with released with 1.4 AmigaDOS) including, AllZoo, EMake McC (2.0), SpeechToy, StarTrek, TxEd-SpeechToy, TxEdref, Txref Txref2, and the complete RexxArpLib2.3, Also included - SoundUtil A set of C source code routines for using the audio device, by Robert Peck, IconMiester - great icon generating program, PopCLI4 - The latest of a must have utility. Now supports arexx in addition to many new enhancements, ArpUserDocs3.1 - Finally, the documentation for the 3.1 release of Arp which replaces most 1.3 AmigaDOS commands (see dd44).

WB1: GRAPHICS and PLOTTING - Several neat graphic and mathematical plotting routines are include; Plot - a three dimensional mathematical function plotter. Can plot any user defined function. Many aspects of the plots are user variables so that almost any combination of rotations, perspectives, and parameters for any function can produce infinite results, Scenery - This generates fractal landscapes. The pictures it generates might remind you of somewhere you've been even though they are entirely random, Surf - BezSurf (or Surf for short) is a program for producing bezier surfaces of revolution. It produces awesome pictures of wineglasses and doorknobs, and other objects one could turn on a lathe. BezSurf includes the capacity to map iff image files onto any surface that it can draw. And others

WB4: TELECOMUNICATION - This disk contains several excellent PD comunication programs designed to get you on line quickly and easily. Access (1.42) - A very nice ANSI term program based on Comm v1.34, but with the addition of transfer protocols; Comm (v1.34) - The best PD communications programs ever made; Handshake (v2.12a) - Full featured VT52/100/102/220 terminal; JRComm (v0.93) - Another great full featured comm program.

FD6: GAMES! - This disk is chalked full of games including; Checkers, Clue, Gold - A new slide the pieces puzzle, Jeopard - An enhanced version of Risk, RushHour - Surprisingly addicting, and SpaceWar - Best described as a cross between Combat-Tanks and asteroids.

FD7: PACMAN - This disk contains several pacman type games including; PacMan87, MazMan and Zonix, also Connect_4 - A checker type game, CRobots - ("see-robots") is a game based on computer programming (excellent), Tiles - A very good solitaire game played with three layers of picture (difficult).

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IN THE MAGAZINE

Special Section: Amiga Around the World; **The Amiga:** A Programmer's Dream; **Buyer's Guides:** Action games, memory expansion, and disk drives; **Just for Fun:** Amiga—The Nintendo of the Nineties?; **CLI Clips:** Become a CLI Expert; **Taking Sides:** Copy Programs—Pirate's Weapon or User's Tool?

ON DISK

No disk is available for this issue.

SUMMER 1989

IN THE MAGAZINE

Multitasking Miner: A conversation with the father of the Amiga; **Amiga Zapshots:** Using Canon's hot new video technology; **Expanding the 500:** Who says the 500 can't be as powerful as the 2000?; **Spotlight:** Digi-View.

ON DISK

Advanced Laser Chess: A high-tech version of chess where your queen is a laser and your pawns act as mirrors. **X-Ray:** A utility that looks through screens. **Mr. Gadget:** Intuition gadgets made easy. **Power Poker:** One of the most addictive games we've seen. **Eight-Color Workbench:** Doubles your Workbench colors. **MultiGadget:** Creates a program-generated grid of gadgets. ***Uedit:*** A flexible shareware text editor. **Art Gallery:** Ready-to-view Amiga art. **Plus!** Source code and data files for all of the On Disk programs.

FALL 1989

IN THE MAGAZINE

Making Great Games Great: You Ain't Seen Nothin' Yet; **Bridging the Gap:** A hands-on look at Commodore's Bridgeboard; **Rodent Roundup:** Alternatives to Commodore's mouse; **Programmer's Page:** From 6502 to 68000; **Abstractions:** Wrestling Commodore's A590 Hard Drive; **Taking Sides:** An Amiga in Every Office?

ON DISK

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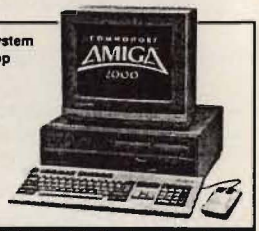

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Randy Thompson

Customizing an Eight-Color Workbench

The Summer 1989 issue of *Amiga Resource* broke the color barrier with its "Eight-Color Workbench" program. Eight-Color Workbench adds four more colors to the Workbench screen by allocating a third bitplane and then calling the granddaddy of all screen-refresh functions, RethinkDisplay( ). (See the Summer 1989 "Programmer's Page" for the program's documentation and C and Modula-2 source code listing.)

Since we use it in our startup-sequence, Eight-Color Workbench appears on every *Resource Disk*. It's in the c directory saved as Colorbench. You may have copied this program to your own boot disk and discovered that, while you're able to get more colors on the Workbench screen, you can't change those colors; they're hard-coded by Colorbench as purple, yellow, red, and green. Preferences still lets you modify Workbench's four standard colors, but it does not recognize the colors added by Colorbench. That's because Preferences assumes you're using a standard Workbench screen which uses color registers 0–3 only. To change the colors added by Colorbench, you need to alter color registers 4–7.

The program listed here, "Change4567," runs from the CLI and allows you to change color registers 4, 5, 6, and 7. To use it, simply copy Change4567 from the c directory of this issue's *Resource Disk* to the c directory of your Workbench disk and enter the following command:

CHANGE4567 *rgb rgb rgb rgb*

where *rgb* is a three-digit hexadecimal (hex) number specifying the red, green, and blue intensity values for the desired color (see below for details). The first *rgb* parameter specifies the hue for color register 4, the next one specifies the hue for color register 5, and so on. To change the color registers to varying shades of green, for example, you might enter this command:

CHANGE4567 040 080 0C0 0F0

If you prefer, you can use a comma or vertical bar (|) to separate each *rgb* parameter. However, Change4567 aborts if it finds too few or too many characters on the command line or encounters an illegal hex character in any of the *rgb* parameters.

Obviously, the best place to use the Change4567 command is in your startup-sequence, directly following the Colorbench command. Change4567 has no effect on a standard four-color Workbench screen.

Color Amiga Style

Amiga colors are created by mixing various levels of the colors red, green, and blue (the three primary colors in transmitted light). Each Amiga color register holds one of 16 different intensity levels for each of these colors, giving you exactly 4096 (16 × 16 × 16) hues to choose from. The color register's high nybble (four bits) is always 0, the next nybble holds the color's red intensity value, the nybble after that holds the color's green intensity value, and the low nybble holds the color's blue intensity value.

When the contents of a color register is shown in hex, each color intensity value is represented by a single digit. The hex number 92F, for example, produces the color violet by specifying a mixture of some red (9), very little green (2), and a lot of blue (F, the highest intensity value possible). This is also how Change4567 interprets its *rgb* parameters. The accompanying color table lists the hex equivalent of several common colors.

You can determine a color's hex value using the Palette program found in the Tools directory of your 1.3 Extras disk. Palette allows you to change a screen's colors using proportional slider gadgets. As you modify a color, the color's corresponding hex value is displayed on the right side of the program's window. Unlike Preferences, Palette recognizes Eight-Color Workbench's extra four colors. You might run Palette to fine-tune your Eight-Color Workbench; then write down the hex value of the last four colors so you can pass them to Change4567 in your startup-sequence. The first four colors must be set by Preferences if you want them to survive a system reboot.

Color Table

Color	RGB Value
Black	000
Blue	00F
Green	0F0
Cyan	0FF
Red	F00
Purple	F0F
Orange	F80
Yellow	FF0
White	FFF
Light Gray	CCC
Medium Gray	888
Dark Gray	444

How It Works

Change4567 first checks the number of the command line parameters to ensure that there are exactly 16 characters waiting to be processed (12 characters for the four *rgb* parameters plus three separating spaces and one linefeed, which the computer tacks on when you hit Enter). If there's an illegal number of characters, the program exits back to the CLI with no harm done.

Change4567 relies on the graphics library function SetRGB4( ) to change the Workbench's upper four colors. SetRGB4( ) takes five parameters: a pointer to the ViewPort whose colors you wish to change, the color register to change (0–31), the red intensity value (0–15), the green intensity value (0–15), and the blue intensity value (0–15).

To get the Workbench's ViewPort address, Change4567 uses a somewhat unorthodox technique: It calls the

Intuition function OpenWorkbench( ) and adds 44 to the value returned. Although not widely documented, OpenWorkbench( ) returns a pointer to the Workbench screen. Most programming manuals will tell you that this function returns a Boolean (TRUE or FALSE) value. Generally, TRUE implies a nonzero value, and since any valid pointer is nonzero, a screen pointer is, in effect, TRUE. In the current version of Intuition, the so-called TRUE value returned by OpenWorkbench( ) is indeed a pointer to the Workbench screen (check it and see). By adding 44 to this value, Change4567 offsets into the Screen structure and obtains the address of Workbench's ViewPort.

Change4567's *rgb* parameters are processed by a short subroutine that reads a character from the command line, checks to see if it's a legal hex ASCII character, and returns its numeric value in register d4. If the character is not within the legal range (0–9 or A–F), the subroutine returns with the carry flag set and the program aborts. This routine accepts both uppercase and lowercase hex letters.

When all three hex digits for a particular color have been read, Change4567 calls SetRGB4( ) and changes the appropriate color register. The program continues this process until it finds an unrecognized character following an *rgb* parameter. At this point, it knows that it has either found an illegal delimiter character (not a space, comma, or vertical bar) or has reached the end of the line and fulfilled its task.

SPECS

Change4567
PROGRAM SIZE: 468 bytes
MINIMUM CONFIGURATION
  512K RAM
  AmigaDOS 1.2
ENVIRONMENT
  CLI
    CHANGE4567 *rgb rgb rgb rgb*

```
* Change4567
* by Randy Thompson
* Copyright (c) 1989 COMPUTE! Publications, Inc.
* All Rights Reserved
* Last Modified 06/11/89
*
*
*    This program works with Amiga Resource's
*    "Eight-Color Workbench." Change4567 allows
*    you to set the Eight-Color Workbench's
*    upper four colors from the CLI or from
*    within your startup-sequence. See the
*    October 1989 issue of Amiga Resource
*    for instructions on the use of this program.
*    Eight-Color Workbench is documented in Amiga
*    Resource's Summer 1989 "Programmer's Page"
*    column. The Eight-Color Workbench program may
*    be found in the c directory of any Amiga
*    Resource magazine disk.
*
*

VIEWPORT      EQU 44            ;Screen structure's ViewPort offset
ExecBase      EQU 4             ;Absolute address of ExecBase pointer

* Function offsets
OpenLibrary   EQU -552
CloseLibrary  EQU -414
OpenWorkBench EQU -210
SetRGB4       EQU -288

   SECTION code,CODE

* Check and save command line parameters
   cmp.l   #$10,d0
   bne     Abort3            ;Abort program if illegal # of parameters
   move.l  a0,a5             ;Save pointer to parameters

* Open intuition.library
   lea     IntuitionName,a1  ;Library name in a1
   clr.l   d0                ;Version number in d0
   move.l  ExecBase,a6       ;ExecBase in a6
   jsr     OpenLibrary(a6)   ;Call OpenLibrary( )
   move.l  d0,IntuitionBase  ;Save IntuitionBase
   beq     Abort3            ;Abort program if OpenLibrary( ) fails

* Open graphics.library
   lea     GraphicsName,a1   ;Library name in a1
   clr.l   d0                ;Version number in d0
   move.l  ExecBase,a6       ;ExecBase in a6
   jsr     OpenLibrary(a6)   ;Call OpenLibrary( )
   move.l  d0,GraphicsBase   ;Save GraphicsBase
   beq     Abort2            ;Abort program if OpenLibrary( ) fails

* Get the WorkBench screen's ViewPort address
   move.l  IntuitionBase,a6  ;IntuitionBase in a6
   jsr     OpenWorkBench(a6) ;Call OpenWorkBench( )
   tst     d0                ;Check WorkBench's screen address
   beq     Abort1            ;Abort program if screen pointer equals 0
   add.l   #VIEWPORT,d0      ;Add offset for ViewPort address
   move.l  d0,WBViewPort     ;Save ViewPort pointer

* Main program loop
   move.l  GraphicsBase,a6   ;Pointer to GraphicsBase in a6
   moveq.l #4,d5             ;Color register number in d5
Loop:
   clr.l   d4
   jsr     GetHex            ;Get red value
   bcs     Abort1
   move.l  d4,d1
   jsr     GetHex            ;Get green value
   bcs     Abort1
   move.l  d4,d2
   jsr     GetHex            ;Get blue value
   bcs     Abort1
   move.l  d4,d3

   move.l  WBViewPort,a0     ;ViewPort pointer in a0
   move.l  d5,d0             ;Color register number in d0
   jsr     SetRGB4(a6)       ;Call SetRGB4( )

   addq.l  #1,d5             ;Increment color register number
   move.b  (a5)+,d4          ;Find delimiter...
   cmpi.b  #' ',d4           ;   space?
   beq     Loop
   cmp.b   #',',d4           ;   comma?
   beq     Loop
   cmp.b   #'|',d4           ;   vertical bar?
   bne     Loop              ;If not a delimiter or if EOL, exit program

* Close graphics.library
Abort1:
   move.l  GraphicsBase,a1   ;GraphicsBase in a1
   move.l  ExecBase,a6       ;ExecBase in a6
   jsr     CloseLibrary(a6)  ;Call CloseLibrary( )

* Close intuition.library
Abort2:
   move.l  IntuitionBase,a1  ;IntuitionBase in a1
   move.l  ExecBase,a6       ;ExecBase in a6
   jsr     CloseLibrary(a6)  ;Call CloseLibrary( )

* Exit the program
Abort3:
   clr.l   d0                ;Set return code
   rts                       ;Drop out of program

* Get and check for a legal hex character and return value in d4
GetHex:
   move.b  (a5)+,d4          ;Get character from command line
   cmp.b   #'0',d4
   blt     BadHex            ;Illegal character if less than '0'
   cmp.b   #'9',d4
   bgt     ChkAlpha          ;Could be a letter if greater than '9'

   sub.b   #'0',d4           ;It's a digit, so get numeric value...
   bra     GoodHex           ;   and return

ChkAlpha:
   and.b   #$DF,d4           ;Clear 5th bit to accept upper- and lowercase
   cmp.b   #'A',d4
   blt     BadHex            ;Illegal character if less than 'A'
   cmp.b   #'F',d4
   bgt     BadHex            ;Illegal character if greater than 'F'

   sub.b   #$37,d4           ;It's a valid hex letter, so get numeric value

GoodHex:
   and.b   #$FE,ccr          ;Clear carry to signify a valid hex character
   rts

BadHex:
   or.b    #$01,ccr          ;Set carry to signify an illegal hex character
   rts


   SECTION data,DATA

IntuitionName:
   dc.b 'intuition.library',0 ;Library name
GraphicsName:
   dc.b 'graphics.library',0  ;Library name


   SECTION mem,BSS

IntuitionBase:
   ds.l 1                    ;Place to store IntuitionBase
GraphicsBase:
   ds.l 1                    ;Place to store GraphicsBase
WBViewPort:
   ds.l 1                    ;Place to store Workbench's ViewPort address

   END
```

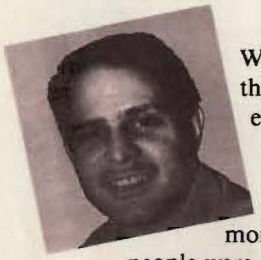
▲

"Programmer's Page" wants your hints and tips. Send all submissions to Programmer's Page, *COMPUTE!'s Amiga Resource*, P.O. Box 5406, Greensboro, NC 27403. We'll pay $25–$50 for each tip we publish. We also welcome single-topic articles, with appropriately higher pay, for this column.

BEST OF THE BOARDS

Sheldon Leemon

VirusX



When I was asked to feature a program in this month's column that checks for and eliminates computer viruses, my first reaction was, "Oh no, not again." Computer viruses have been in the news almost constantly these last few months, and I figured that by now most people were aware of them and were taking steps to avoid them. But when the editors told me that more than one-fifth of the disks that readers send as submissions are infected with one form of virus or another, I was forced to reconsider. Obviously, this is a story that bears repeating.

A computer virus is a hidden program that can copy itself to every disk you insert into your drive. What else the program does depends on how malicious its creator is.

Even the most benign form of virus can cause permanent damage to your disks, however. The first Amiga virus, the SCA virus, merely printed an annoying message from time to time. But the virus spread by rewriting the boot block of each disk that was inserted into the drive. On a normal Workbench disk, a boot-block virus like the SCA causes no permanent harm. But many commercial games store program information or copy-protection data there. When a virus overwrites a boot block on a commercial program disk, it may ruin the disk.

Fortunately, there are some simple precautions that you can take to avoid receiving these unwelcome visitors. First, be aware of how viruses spread. Because most viruses are written on the boot block of a disk, you're most likely to get one by placing a disk into somebody else's computer or by copying a disk of unknown origin. The majority of viruses seem to come from abroad, so copies of commercial programs that have not yet appeared on store shelves should be viewed with the utmost suspicion. You are much less likely to get a virus from a program that you download from a bulletin board or from a nonbootable disk.

Since viruses reproduce by writing themselves onto your disks, a simple way to protect a disk is by setting its write-protect tab so that the window is in the open position. All of your original disks should be write-protected to prevent accidental erasure as well as infection.

Another way to protect yourself is through the use of a virus checker/eliminator program. Although there are many programs that can be used to combat the spread of computer viruses on the Amiga, none is more widely used or highly regarded than Steve Tibbet's *VirusX*. In fact, in some countries outside the U.S., the local Commodore subsidiary packages a copy of *VirusX* with each Amiga that it sells. A bogus version 3.3 has been circulated on some bulletin boards, but it is a fraud that contains an embedded virus.

VirusX protects you in two ways. When you first run the program, it checks the computer's memory to see if any of the known virus programs are lurking there, waiting to copy themselves onto your disks. If so, it asks if you wish to destroy the RAM copy. Next, if you leave the program running, it will check the boot block of each disk as it is inserted into your disk drives. If it finds a nonstandard boot block, it pops up a requester that informs you of that fact and asks if you want to rewrite the boot block. If you choose to write over the boot block, the program warns you that doing so may destroy the disk if the program is a game.

A Swedish user group sent Steve nearly $4,000 as thanks for this virus killer.

VirusX does not guarantee complete protection against viruses. For one thing, new virus types are constantly evolving. A recent example is the IRQ virus, which attaches itself to programs instead of to the disk's boot block. Steve has devised the program *KV* to deal with it. (Both programs can be found on this issue's companion disk.) Another fact to consider is that some legitimate programs install themselves in memory in a fashion similar to virus programs. An example of this is the Setpatch program on Workbench 1.3. If used with the *r* option, this program makes it possible for machines with a megabyte of chip RAM to use RAD:, the recoverable ramdisk. It does so, however, in a manner that makes *VirusX* suspect that a virus is installed. If you are using the Setpatch r command, ignore *VirusX*'s warning about the ColdCapture vector.

Like the viruses it combats, *VirusX* is meant to be distributed as widely as possible. Although Steve Tibbet has never included a request for shareware donations with the program, many users have contributed to his efforts to eliminate these pests. In fact, a Swedish user group with over 1400 members sent Steve almost $4,000 to show its appreciation. Even if you don't feel the urge to match this group's generosity, you still can help Steve in his battle against the forces of evil. Send him any new viruses that you discover, but please be sure that they are truly new. The program is available from a variety of sources, so try to keep up-to-date. And please, use the program—preferably before sending any more submissions to *Amiga Resource*. ▲

HOW TO USE THE DISK

Every issue of *Amiga Resource* has a companion disk that features the exclusive programs we offer each issue, as well as the "Best of the Boards" program and the "Art Gallery" screens. You can get this disk in three ways. First, you may buy *Resource* with the disk in a poly-bag at your bookstore or computer dealer. Second, you may subscribe to the magazine with the disk. Third, you may order single copies of this disk (see the back-issues/disk-order ad elsewhere). If you experience a problem with the disk, even after you've read the programs' documentation, please contact us at (919) 275-9809 between 9:00 a.m. and 4:30 p.m. Eastern standard time, Monday through Friday.

To use the disk, insert it into your disk drive and then turn on your computer. (Amiga 1000 owners must boot with Kickstart first.) You may boot with your own Workbench disk, but the icons will not be as colorful as they are when you boot with the magazine disk.

You run programs by double-clicking their icons. Some programs may be found within drawers (icons that resemble file folders). Please look into each drawer on the disk. We recommend that you read the "On Disk" section of the magazine prior to running any of our programs. If you wish to move a program that is in a drawer to another disk, be sure to copy the entire drawer so that you can be sure that you copy all the support files that the program may need.

Most programs on the disk are accessible through the Workbench environment. Some programs, however, are designed to work only in the CLI environment. Such programs do not have icons and are not visible from the Workbench. Since the magazine disk may be too full to include many CLI commands, you will have to boot with your own disk to access the CLI and work with these programs.

Artwork from "Amiga Art Gallery" may be found in the ArtGallery drawer. To view a picture, double-click its icon. When the painting appears onscreen, simply click the mouse once to return to the Workbench.

Our disk is not copy-protected. We encourage you to make a backup of the disk as soon as possible. With the exception of the program in our "Best of the Boards" column, the contents of the disk are copyrighted and may not be used by anyone other than the owner of the magazine. Artists who appear in "Amiga Art Gallery" hold the copyrights to their own work. Amiga Workbench version 1.3 is copyright 1985, 1986, 1987, and 1988, Commodore-Amiga, Inc., all rights reserved. All other disk contents are copyright 1989, COMPUTE! Publications, Inc., all rights reserved. We ask that you respect the copyrights of the works on the disk and of the disk in its entirety.

We suggest that you write-protect the disk by sliding the write-protect tab to the open position. This will cause programs that attempt to write to the disk to fail. You can slide the write-protect tab to the closed position to allow writing, but there may not be enough room on the disk for any more files. If this is true, copy the offending program to another disk to use it.

On Disk This Issue

There are four programs on the disk that run from the CLI only. These programs are "Change4567," from the "Programmer's Page"; "SYSCHECK," from Jim Butterfield's "CLI Clips"; *KV* (Virus Killer), from "Best of the Boards"; and "PlaySample," from "Ask Rob Peck." Except for *KV,* all of these programs may be found in the c directory of the magazine disk. *KV* is located in the BestofBoards directory. To use any of these programs, you'll need to boot with the Workbench disk that came with your computer and use the CLI.

For those who prefer not to bother with the CLI, we have provided a Workbench-executable IconX example for Rob Peck's PlaySample program. To use it, simply double-click the PlayScript icon found in the AskRobPeck drawer. An enthusiastic "Hello World!" will be emitted from your computer.

To obtain the fastest and smoothest graphics possible, the game "Rejection" turns off multitasking when it's run. Because of this, you cannot snapshot the Rejection screen using this issue's "Snap!Plus" utility. Snap!Plus, as with other screen grabbers, will only capture screens when multitasking is turned on.

With the exception of Steve Tibbet's *KV* program and Jim Butterfield's SYSCHECK utility, the source code for all of the programs on disk may be found in the disk's Source directory. Within Source are separate directories for each of the programs. For example, the source code for "Rejection" may be found in Source/Rejection. The Source directory does not have an icon and cannot be accessed via the Workbench. Again, you'll need to boot with the Workbench disk that came with your computer and use the CLI to access these files.

If you own a sound digitizer or a sound-manipulation program, you may be interested in the digitized sounds that accompany our "Rejection" program—there are three sound samples in all. These digitized sounds may be found in the Rejection directory with a .sample filename extension. Since these sounds are stored in raw format (not in IFF), they cannot be played using Rob Peck's PlaySound program. ▲

On Disk Directory

```
c (dir)
  AddBuffers                CD
  Change4567                Colorbench
  EndCLI                    IconX
  LoadWB                    more
  PlaySample                run
  SysCheck                  SysCheck.DOC
  V                         Wait
system (dir)
  diskcopy
i (dir)
  Disk-Validator            Ram-Handler
devs (dir)
  ramdrive.device           system-configuration
s (dir)
  Snap_Icon.info            Startup-Sequence
Mosaic (dir)
  .info                     Mosaic
  Mosaic.info
source (dir)
     Snap!Plus (dir)              MySavePict.mod
       MySavePict.def
       SnapPlus.mod
     Change4567 (dir)
       Change4567.a
     AskRobPeck (dir)
       PlaySample.c
     Mosaic (dir)
       Mosaic.c                   Mosaic.Shapes
     BestofBoards (dir)
       makefile                   source.note
       VirusX.c                   VirusX.i
     MacroKeys (dir)
       MacroKeys.c
     Rejection (dir)
       EBInput.def                EBInput.mod
       EBSound.def                EBSound.mod
       Menu.def                   Menu.mod
       Rejection.mod
libs (dir)
  arp.library               icon.library
  info.library              version.library
BestofBoards (dir)
  .info                     KV
  KV.doc                    KV.doc.info
  Release.note              VirusX
  VirusX.doc                VirusX.doc.info
  VirusX.info
ArtGallery (dir)
  .info                     Caddy_Tail
  Caddy_Tail.info           Drawing
  Drawing.info              Jacuzzi_Musing
  Jacuzzi_Musing.info
MacroKeys (dir)
  .info                     default.macrokeys
  MacroKeys                 MacroKeys.info
Rejection (dir)
  .info                     noise1.sample
  noise2.sample             noise3.sample
  ominous.sample            Rejection
       Rejection.info            rjtback
       rjtshape
  .info                     ArtGallery.info
  BestofBoards.info         Disk.info
  Hello.sample              MacroKeys.info
  Mosaic.info               PlayScript
  PlayScript.info           Rejection.info
  Snap!Plus                 Snap!Plus.info
```

TAKING **SIDES**

Rhett Anderson vs. Randy Thompson

AmigaDOS 1.4 — Too Much, Too Soon?

TREAD CAREFULLY! At the most recent Amiga developers' conference, Commodore unveiled plans for an ambitious new version of the Amiga operating system.

Foremost among the changes is the overhaul of the Workbench. Now, you'll truly be able to use the Amiga at the icon level.

So what's the catch? Well, remember the Kickstart disk? It loaded the operating system in the Amiga 1000. The best aspect of Kickstart was that it made it easy to update the operating system. The worst was that it made booting the 1000 an almost comical disk-changing game. The 500 and 2000 were released with Kickstart in ROM.

Kickstart in ROM was a kind of promise from Commodore: "The operating system is stable. The bugs are gone. Users can be sure that everything is solid now. Developers can be sure that everything is solid." Not anymore. Preliminary reports suggest that every Amiga 500 and 2000 owner in the world will have to get their ROMs switched. Guess what—it's gonna be a mess.

I know Amiga owners who haven't even heard of 1.3 yet. Their first encounter with 1.4 will be when they buy a software package with the mysterious phrase *1.4 required* on it and find it doesn't work on their machine. Long after the technocrazy crew here at COMPUTE! all have 1.4, many of our readers will still have 1.3 or even 1.2.

Will software producers write 1.4-specific code? Most won't, not for awhile. Not when they know their products won't run on a large number of systems.

And what about the software we own now? Will 1.3 Workbench run on a 1.4 Kickstart? If not, when should *Amiga Resource Disk* switch from using 1.3 to 1.4? When more than half of our readers have 1.4?

It all leaves a bad taste in my mouth. Let's hope Commodore puts compatibility first and power second. Otherwise we may not be able to enjoy the power.

Looking over at Mr. Thompson's side, it's hard to see anything but a jumble of words. Did you type these words, Mr. Thompson, or did they just fall out of a hole in the side of your head?

Not too inconvenient? What if you don't have an Amiga dealer in town? And ROM updates *are* new to the large majority of Amiga owners. Owners of the 1000 had to change disks only, not ROMs. And most 500 and 2000 owners still have the ROMs that were in their computers when they bought them.

You need to pay more attention, Mr. Thompson.

FULL SPEED AHEAD! Change is good, and system 1.4 sounds great. The specs read like an Amiga user's wish list: an improved Workbench, a fast file system for floppies, no more gurus, new programming functions. . . . The list goes on and on. For once, Commodore actually seems to be listening to us.

For 500 and 2000 owners, stepping up to 1.4 will require a ROM-chip replacement as well as a new Workbench disk—about a $40–$50 investment, from what I figure. Overall, a small price to pay for the enhancements you'll receive. Not too inconvenient, either. To upgrade a Macintosh Plus to 256K ROMs, you have to buy a whole new computer (now *there's* an upgrade policy).

So what if 1.4 software won't run on a 1.3 machine? What do you expect? You don't want Commodore to add features and then tell developers not to take advantage of them. You can't improve a computer's operating system and retain full downward compatibility.

Commodore can't force you to upgrade. Machines with 1.2 and 1.3 ROMs will still work, just not as well as those equipped with 1.4 ROMs. Of course, you won't be able to take advantage of new software if you don't upgrade, but that's the price you pay.

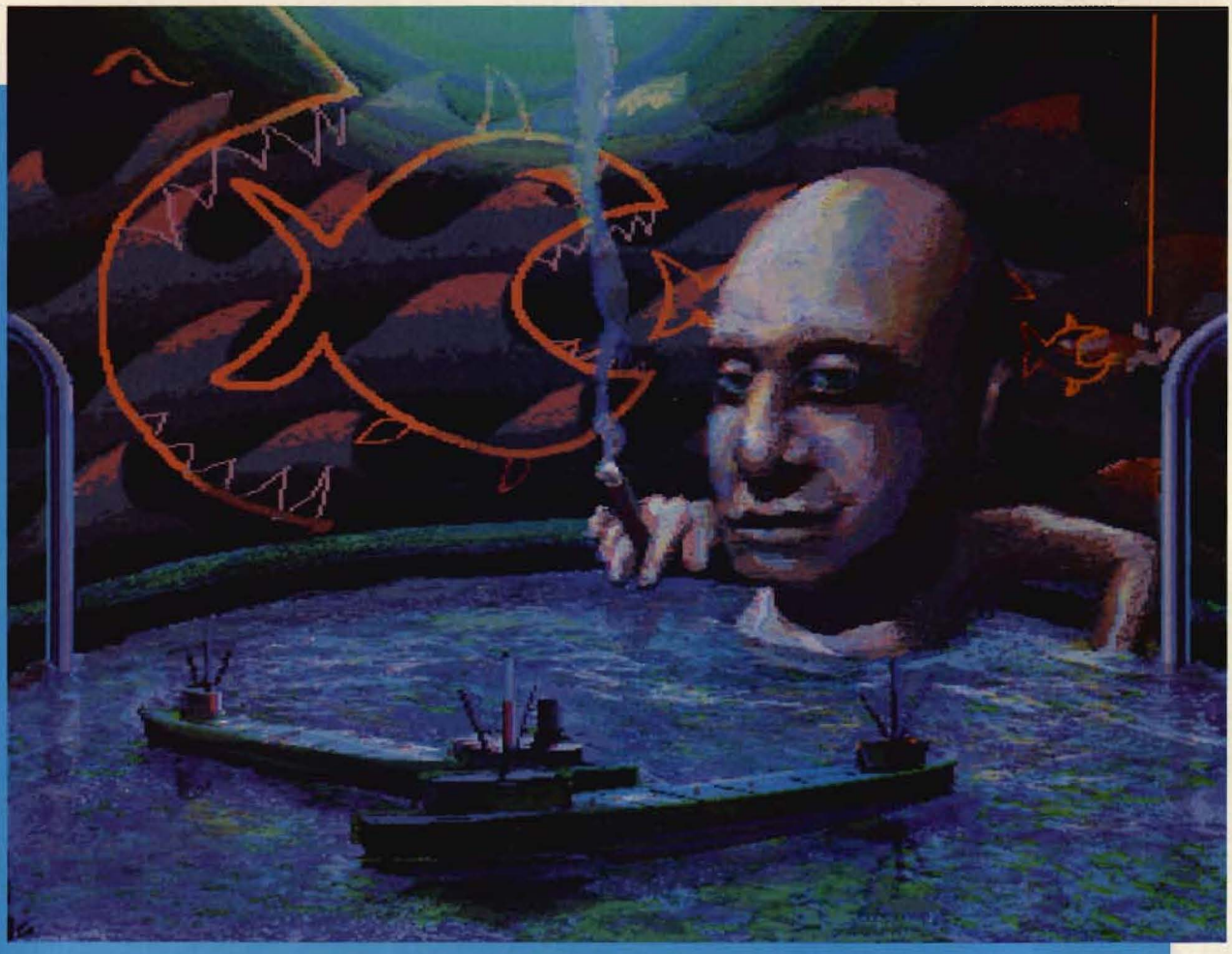
If anything, 1.4 should have been out already. It's never too early for better, more capable software to come along, even if it does make the current software obsolete. You wouldn't have wanted Commodore to hold back the Amiga simply because it outdated the 64, would you?

System/ROM code updates are not new to Commodore. It happened back when the Amiga busted its 1.0 britches and graduated to 1.1. The same thing happened with the 1.2 upgrade, and it's bound to happen again. It's called *progress.* You move ahead, or you get left behind. You upgrade from a VIC-20, or you work in 22 columns. It's that simple.

Looking over at Mr. Anderson's side, it gladdens me to think that this guy works for COMPUTE!. If he didn't, Commodore might have hired him as a design consultant, and I'd be writing about machines with built-in PET emulation and buggy system code.

I especially like his profound statement, "compatibility first and power second." Which do you want, Mr. Anderson? If you want full compatibility, don't buy a computer. When operating systems improve, so does the software. You see, change is good, and so is 1.4. ▲

art gallery



Welcome to "Amiga Art Gallery." On these pages, in each and every issue of *COMPUTE!'s Amiga Resource,* you'll find the best Amiga artwork around. The pictures in this issue may also be found on the magazine's accompanying disk.

Jacuzzi Musing

Tom Miller

Corwin Springs, MT

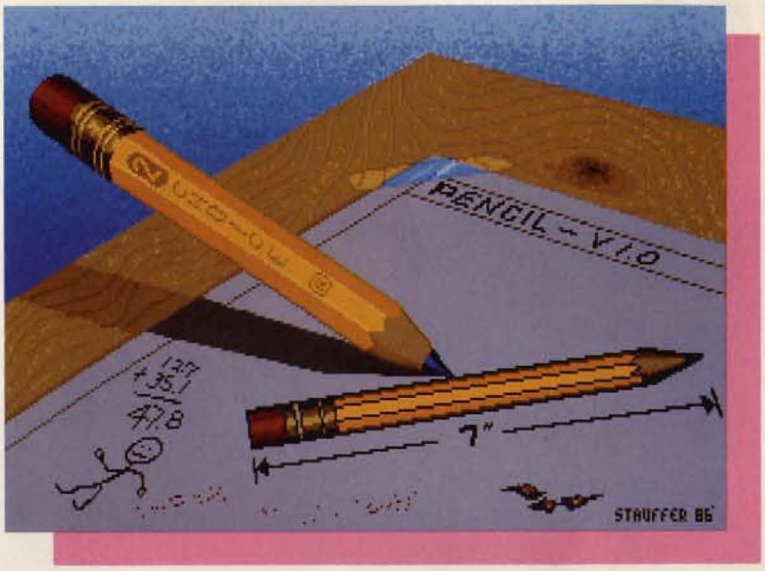
This unique picture started out in *Deluxe Paint II* and was finished with *Photon Paint* using overscan HAM mode. Artist Tom Miller describes the scene as "a modern-day Richard III musing over his power in a jacuzzi filled with toys."

Drawing

Dewayne Stauffer

Pocatello, ID

"*Drawing* was produced using *Aegis Images*. I've been creating Amiga art for two years now. I enjoy using the Amiga as a high-tech medium for artistic expression and believe the possibilities are endless."



Caddy Tail

Vincent Morano, Jr.

Bloomington, NY

"*Caddy Tail* was created using *Deluxe Paint II* in interlace mode. I find that interlace mode allows for a slightly better degree of detail while retaining the use of a full 32-color palette."

If you'd like to see your art in these pages, send it to us on disk at the following address. We pay $100 for each piece of art we accept. Rejected submissions are returned only to artists who enclose a self-addressed, stamped envelope.

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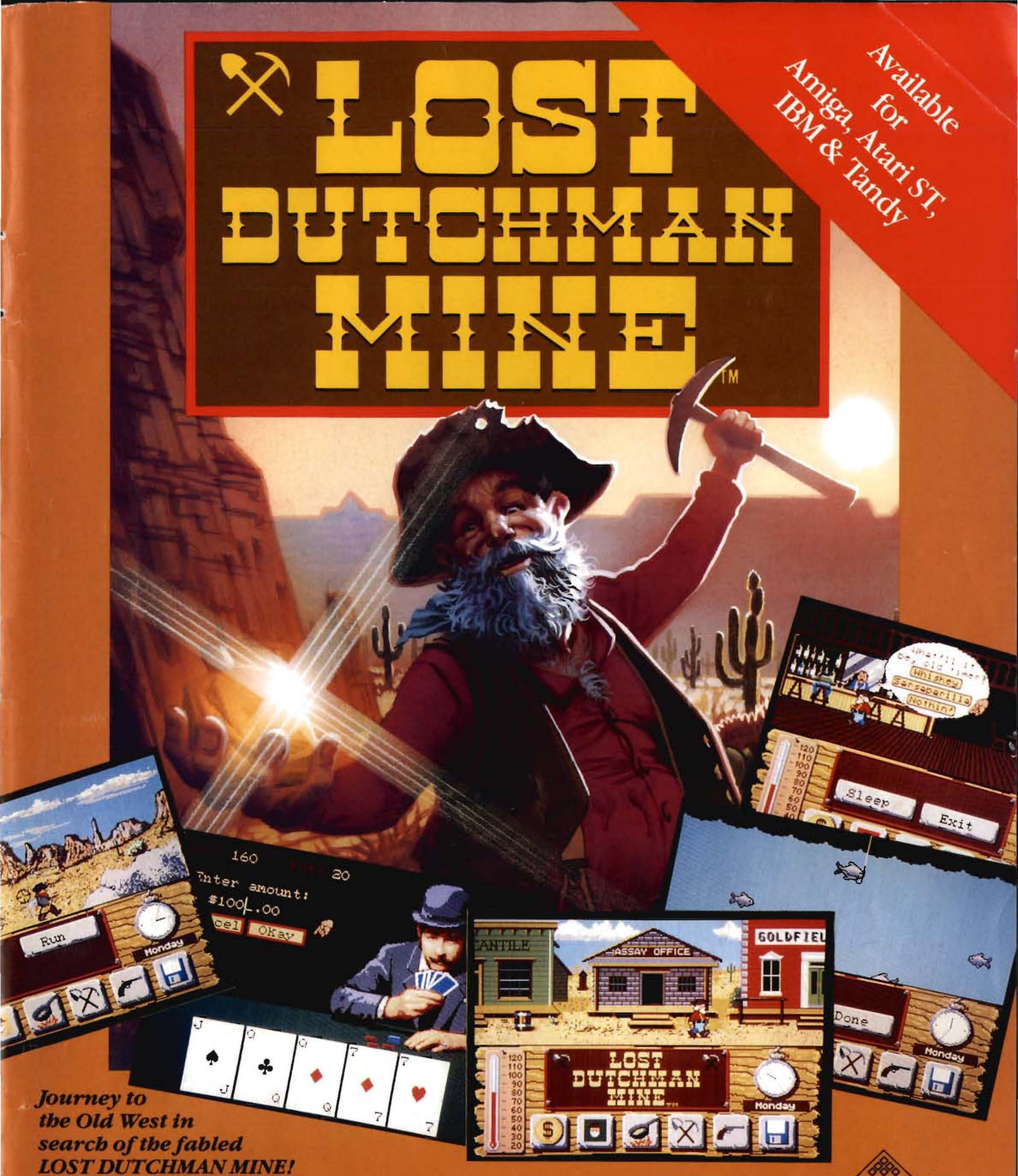

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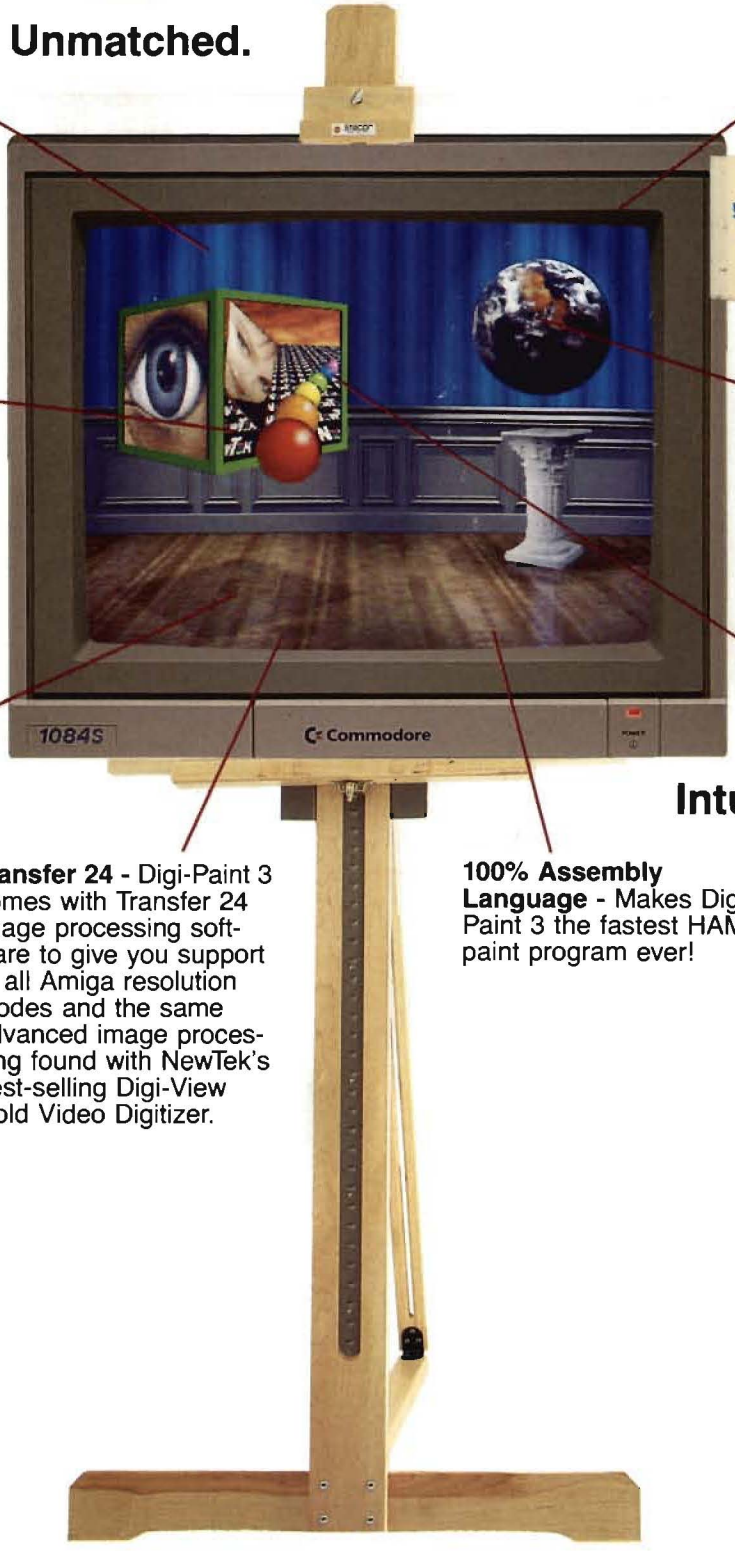

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